

AD-A067 128

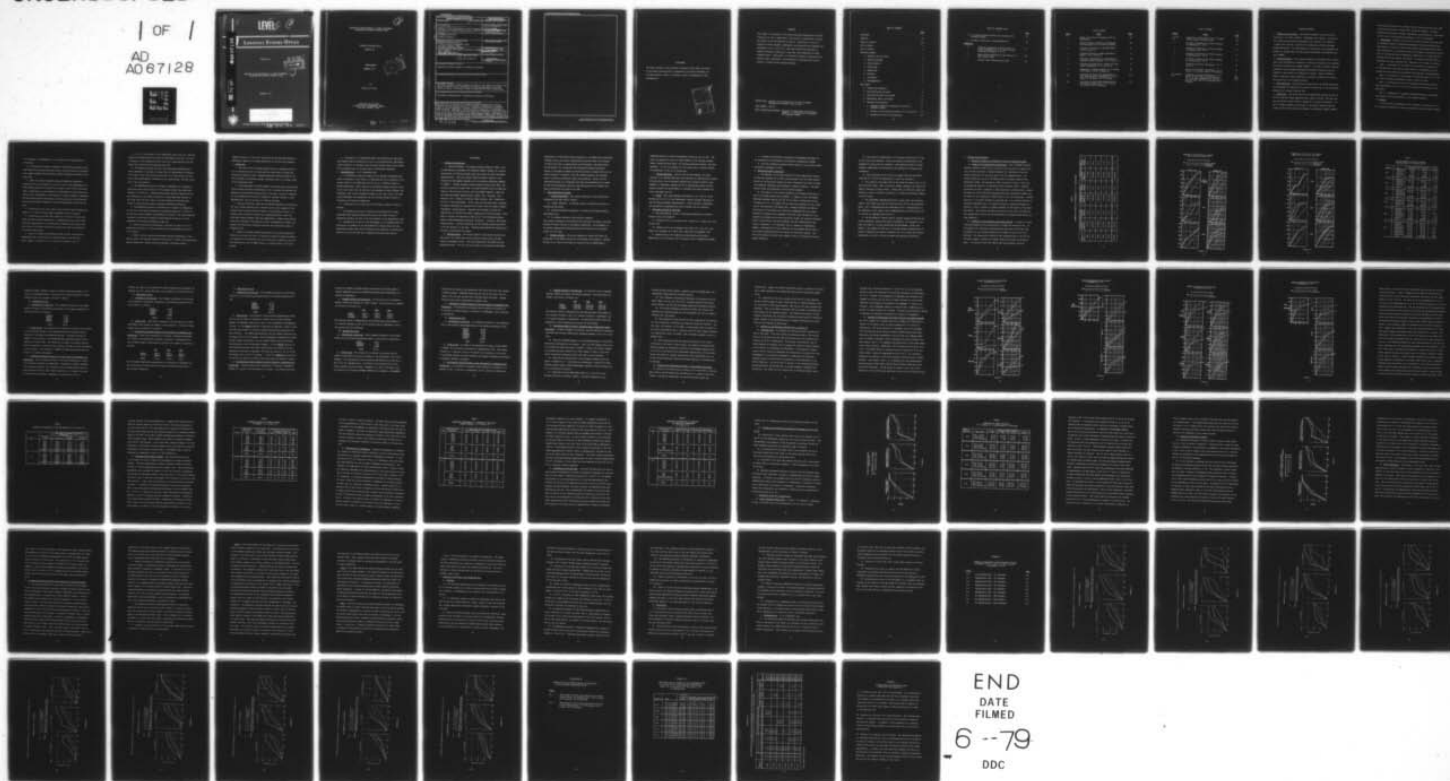
LOGISTICS STUDIES OFFICE (ALMC) FORT LEE VA  
ANALYSIS OF THE PROJECTED FY 79 ARMY PROCUREMENT APPROPRIATION --ETC(U)  
FEB 79 V W PERRY

F/G 5/1

UNCLASSIFIED

NL

1 OF 1  
AD  
A067128



END  
DATE  
FILMED  
6 --79  
DDC

✓  
**LEVEL II**

②

AD A0 671 28

## LOGISTICS STUDIES OFFICE

PROJECT 812



ANALYSIS OF THE PROJECTED FY 79 ARMY PROCUREMENT  
APPROPRIATION CUSTOMER FINANCIAL PLAN

DDC FILE COPY

FEBRUARY 1979



US ARMY  
LOGISTICS MANAGEMENT CENTER  
FORT LEE, VIRGINIA  
23801

APPROVED FOR PUBLIC RELEASE, DISTRIBUTION UNLIMITED

79 04 06 036

2

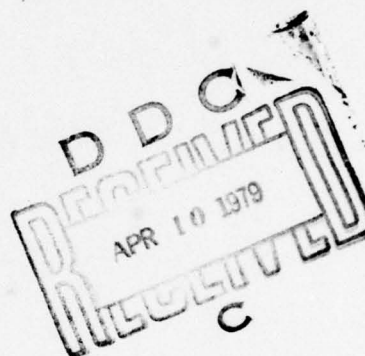
ANALYSIS OF THE PROJECTED FY 79 ARMY PROCUREMENT  
APPROPRIATION CUSTOMER FINANCIAL PLAN

LOGISTICS STUDIES OFFICE

PROJECT 812

FINAL REPORT

FEBRUARY 1979



BY

Virginia W. Perry

LOGISTICS STUDIES OFFICE  
US ARMY LOGISTICS MANAGEMENT CENTER  
FORT LEE, VIRGINIA 23801

79 04 06 036



UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)		5. TYPE OF REPORT & PERIOD COVERED
Analysis of the Projected FY 79 Army Procurement Appropriation Customer Financial Plan		9 Final Report
7. AUTHOR(s)		6. PERFORMING ORG. REPORT NUMBER
Virginia W. Perry		LSO Project 812
9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
Logistics Studies Office US Army Logistics Management Center Fort Lee, Virginia 23801		
11. CONTROLLING OFFICE NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
US Army Materiel Development & Readiness Command ATTN: DRCPP-P 5001 Eisenhower Avenue, Alexandria, Virginia 22333		
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE
12 75p		February 1979
		13. NUMBER OF PAGES
		73
		15. SECURITY CLASS. (of this report)
		UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report)		
Approved for Public Release; Distribution Unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
The views, opinions, and/or findings contained in this report are those of the author and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number)		
Procurement; Appropriation; International Logistics; Forecasting		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)		
This report is an analysis of the Army Procurement Appropriation Customer Financial Plan and in particular of the accuracy of projections of customer orders on the RCS CSCAB-307-11 reports. Projections of the FY 79 program of orders accepted, commitments, and obligations are compared with performance in FY 77 and FY 78. Since FMS orders have presented the greatest forecasting difficulty in the past, some suggestions are made regarding these. Additionally, an alternative method of projecting total program orders, commitments, and obligations is described which may be helpful in refining future program forecasts.		

DD FORM 1473 EDITION OF 1 NOV 65 IS OBSOLETE

409 161

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)





DISCLAIMER

The views, opinions, and/or findings contained in this report are those of the author and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

ACCESSION for	
NTIS	White Section <input checked="" type="checkbox"/>
ROC	Buff Section <input type="checkbox"/>
UNCLASSIFIED	
EXEMPTION	
BY	
DISTRIBUTION/AVAILABILITY CODES	
17	18 / or SPECIAL
A	

# ABSTRACT

This report is an analysis of the Army Procurement Appropriation Customer Financial Plan and in particular of the accuracy of projections of customer orders on the RCS CSCAB-307-11 reports. Projections of the FY 79 program of orders accepted, commitments, and obligations are compared with performance in FY 77 and FY 78. Since FMS orders have presented the greatest forecasting difficulty in the past, some suggestions are made regarding these. Additionally, an alternative method of projecting total program orders, commitments, and obligations is described which may be helpful in refining future program forecasts.

REPORT TITLE: Analysis of the Projected FY 79 Army Procurement  
Appropriation Customer Financial Plan

STUDY NUMBER: LSO 812

STUDY INITIATOR AND SPONSOR: Director for Procurement and Production  
(DRCPP-P), US Army Materiel Development  
and Readiness Command



## TABLE OF CONTENTS

	<u>Page</u>
Disclaimer	i
Abstract	ii
Table of Contents	iii
List of Tables	v
List of Figures	vi
Executive Summary	
1. Authority for the Study	1
2. Problem Statement	1
3. Study Objective	1
4. Study Scope	1
5. Methodology	2
6. Findings	2
7. Conclusions	5
8. Recommendations	6
Main Report	
1. Problem and Background	7
2. Study Objectives and Scope	8
3. Data Base Utilized in the Study	9
4. Methodology Used in the Study	10
5. Analysis and Discussion	12
a. Analysis of Results of Scrubbing of the FY 79 Customer Program	12
b. Analysis of the Historical Record of FY 77 and FY 78	24
c. Evaluation of the FY 79 Projections	38

TABLE OF CONTENTS (Cont)

	<u>Page</u>
6. A Proposed Alternative Method for Projecting the Customer Program	45
7. Findings, Conclusions, and Recommendations	49
<u>APPENDICES</u>	
A Graphical Comparisons in Dollar Values of Actual Performance in FY 77 and FY 78 with Projected Performance in FY 79	A-1
B Order Value Attributable to Each GOA and to Each Customer Type	B-1
C Customer Order Classification Codes	C-1

# LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>PAGE</u>
1	Summary of Results of Scrubbing of FY 79 Projections	13
2	Detailed Summary of Results of Scrubbing the Projections of FY 79 Orders Accepted	16
3	Accuracy of Projection of the FMS Orders in FY 77 and FY 78	31
4	Cumulative Percent of Orders Accepted by Quarter - FY 77 and FY 78	33
5	Cumulative Commitments as a Percentage of Cumulative Orders Accepted - FY 77 and FY 78	35
6	Cumulative Obligations as a Percent of Cumulative Commitments - FY 77 and FY 78	37
7	Comparison of Orders Accepted - FY 77 Actual, FY 78 Actual, and FY 79 Projected	40
B-1	Percentage of Order Value Represented by Each Type Customer by Appropriation - FY 77 Actual, FY 78 Actual, FY 79 Projected	B-2
B-2	Percentage of Order Value Represented by Each GOA by Appropriation - FY 77 Actual, FY 78 Actual, FY 79 Projected	B-3



# LIST OF FIGURES

<u>FIGURE</u>	<u>TITLE</u>	<u>PAGE</u>
1-1 and 1-2	Comparison of Projections of FY 79 Program Made in August and October 1978	14 15
2	Accuracy of Projection of Orders Accepted by Appropriation - FY 77	26
3	Accuracy of Projection of Orders Accepted by Customer Type - FY 77	27
4	Accuracy of Projection of Orders Accepted by Appropriation - FY 78	28
5	Accuracy of Projection of Orders Accepted by Customer Type - FY 78	29
6	Patterns of Quarterly Performance - FY 77 and FY 78	39
7	Patterns of Quarterly Performance - FY 77 Actual, FY 78 Actual, and FY 79 Projected	43
A-1 through A-9	Comparison of Actual Performance in FY 77 and FY 78 with Projected Performance in FY 79 (For Each Appropriation, For Each Customer Type, and For All Appropriations Combined)	A-2 thru A-10

## EXECUTIVE SUMMARY

1. Authority for the Study. The tasking statement for this study was contained in the letter, DRCPA-S, 5 September 1978, subject: LSO Project 812, International Logistics Data Bases, with inclosure, DF, DRCPP-P, 3 August 1978, subject: LSO Study 712, Forecasting of FMS Procurement Funding Obligation. The study sponsor is the Director for Procurement and Production, Headquarters, US Army Materiel Development and Readiness Command (DARCOM).
2. Problem Statement. The accurate prediction of customer orders, commitments, and obligations is necessary to insure the availability of authority and funds to execute the customer program. In the past, accurate forecasts required by the Procurement Appropriation Customer Financial Plan, RCS CSCAB-307, have proved to be difficult to achieve. Better procedures, models, equations, and/or guidelines are desired to improve the accuracy of projections of the customer program.
3. Study Objective. The objective of this study is to develop guidelines and techniques for improving the accuracy of projections of the Procurement Appropriation Customer Financial Plan.
4. Study Scope. This study concerns the Reimbursable Customer Program of the five Army Procurement Appropriations; namely, Aircraft, Missiles, Weapons and Tracked Combat Vehicles, Ammunition, and Other Procurement. The FY 79 customer programs involve eight of the General Operating Agencies (GOAs) of the US Army Materiel Development and Readiness Command (DARCOM).

Three customer programs are included; namely, Foreign Military Sales (FMS), the Military Assistance Program (MAP), and Other Customers. Elements analyzed include orders accepted, commitments, and obligations. Performance in FYs 77 and 78 and projected performance in FY 79 are analyzed.

5. Methodology. Numerical data used in the study analyses were taken from the published reports, Procurement Appropriation Customer Financial Plan, RCS CSCAB-307, covering the period from October 1976 through October 1978. Other information in this report derives from comments of personnel involved with the customer program at Headquarters DARCOM and at its GOAs and from published directives, studies and reports. The general approach taken to accomplish the study objectives was comprised of four steps, as follows:

Step 1 - An analysis of the effect of the October 1978 scrubbing of FY 79 projections first made in August 1978 and a documentation of the reasons for major changes as provided by GOA comptroller representatives.

Step 2 - An analysis of the accuracy of projections made in FY 77 and FY 78 and of quarterly performance trends in those two years.

Step 3 - An evaluation of the FY 79 scrubbed projections, using the actual performance in FY 77 and FY 78 as the basis for evaluation, when applicable.

Step 4 - A development of suggested methods/techniques for improving the accuracy of future projections of the customer program.

6. Findings.

a. The net effect DARCOM-wide of the scrubbing of projections of the FY 79 customer program was to reduce the projected value of orders accepted



by 3.3 percent, of commitments by 10.1 percent, and of obligations by 6.4 percent.

b. No significant changes in methods of forecasting were made by the GOAs during the scrubbing operation; rather, earlier errors were corrected and a simple updating was made based on added information available at the later date.

c. There was general agreement among the DARCOM GOA comptroller representatives that forecasts of the total value of the reimbursable customer program should not be based on the trend of total value in previous years. Additionally the GOA comptroller representatives stated that evaluation of the time-phased FY 79 projections of orders accepted, commitments, and obligations against performance in previous years was invalid because of the many procedural changes that have been implemented in the last two years.

d. Projections of the total order value of MAP and Other Customer programs in FY 77 and FY 78 were within acceptable levels of accuracy.

e. Projections of the FMS order values in FY 77 and FY 78 were much higher than what actually materialized. DARCOM-wide and for most of the individual appropriations, the projections of mid-year order values were much closer to the values realized by year-end than were the projections of year-end order values.

f. Orders not requiring commitment because of their classification represented only a minor portion of orders accepted in the last two years; namely, 5.6 percent in FY 77 and only 0.5 percent in FY 78.

g. In FY 77, 89 percent of total DARCOM-wide order value (all classifications) was committed and 78 percent was obligated by year end. In FY 78, 87 percent of total DARCOM-wide order value (all classifications) was committed and 78 percent was obligated by year end.

h. The quarterly pattern of order value acceptance DARCOM-wide was fairly consistent in the past two years; that is, approximately 50 percent of the year's total order value materialized in the first quarter, 25 percent in the second quarter, 20 percent in the third quarter, and only 5 percent in the last quarter.

i. The DARCOM-wide pattern of cumulative commitments as a percent of cumulative order value by the end of each quarter showed some consistency between FY 77 and FY 78. Commitment performance generally improved as the year advanced; it was evidently difficult to keep commitments abreast of the large influx of order value in the first quarter but reduced order volume in later quarters permitted improved commitment performance.

j. The DARCOM-wide pattern of obligations as a percent of commitments by the end of each quarter showed good consistency between FY 77 and FY 78. For the first three quarters, approximately two-thirds of the value committed by quarter end had been obligated and approximately 90 percent of total commitment value had been obligated by year end.

k. Based on projection inaccuracies in the past two years, the FY 79 DARCOM-wide projection of orders accepted may be overestimated by as much as 15 percent.

l. Based on fairly consistent performance patterns DARCOM-wide in the past two years, the quarterly phasing of projected FY 79 order value percentages appears appropriate, whereas projected commitment performance appears

somewhat optimistic in the first three quarters and projected obligation performance appears to be unduly pessimistic in the first two quarters.

7. Conclusions.

a. The trend of total customer program values in preceding years is not a satisfactory basis for projecting the total value of current and future year programs; rather, program projections should be based on current knowledge of individual customer intentions, that is, on known, pending and developing cases.

b. Over-projections of the FMS program in previous years resulted from several causes including overestimation so as to obviate the necessity for additional authority/fund requests later in the year, failure to recognize the long elapsed times from first evidence of customer interest to case implementation, and the inclusion of "walk-in" business.

c. Although historical trends are considered unsuitable for projecting the total customer program value, forecasts of all other elements of the program should consider statistics based on the historical record. As a minimum, these statistics include case acceptance/rejection rates (by individual country/customer type where appropriate); elapsed times between major case development and execution actions; time-phasing of orders, commitments and obligations throughout the year; and cancellation rates of accepted orders.

d. Based on consistent DARCOM-wide patterns of customer program performance in the past two years, an alternative method of program projection is considered to have potential for use at each GOA in addition to the current method and for use at DARCOM level as a validity check on the total program.



e. Development of a computerized model for forecasting the FMS customer program should be delayed until Part B of the DD Form 2060, FMS Obligational Authority, is automated under the Army Customer Order Control System and an adequate base of historical data is accumulated thereafter.

8. Recommendations. It is recommended that:

a. An alternative method of projecting the customer reimbursable program, as described in this report, be considered for use in addition to the current method at the DARCOM GOAs and for use as a validation check at DARCOM headquarters. Major features of the method include projection first of the total order value for the year from knowledge of known, pending, and developing cases and the subsequent phasing of this total value, with associated commitments and obligations, by time periods through the year in accordance with historical experience.

b. Projections of the total value of FMS orders include no "walk-in" business.

c. Consideration be given to changing the RCS CSCAB-307-11 report requirement from separate forecasts for each of the twelve months to aggregated forecasts for each of the four quarters of the appropriation year.

d. Consideration be given to the development of an automated model for forecasting the elements of the RCS CSCAB-307-11 reports after the automated Army Customer Order Control System has been augmented to include data from Part B of DD Form 2060 and an adequate data base exists therein.

## MAIN REPORT

### 1. Problem and Background.

a. Problem Statement. The General Operating Agencies (GOAs) of the US Army Materiel Development and Readiness Command (DARCOM) are required periodically to forecast customer sales that impact the Army Procurement Appropriations. (The term "General Operating Agency" applies to the Research and Development Commands and to the Materiel Readiness Commands of DARCOM.) Customer programs include Foreign Military Sales (FMS), The Military Assistance Program (MAP), and Other Customers which includes programs of other military services and US government agencies. There are five Army procurement appropriations; namely, 2031 - Aircraft, 2032 - Missiles, 2033 - Weapons and Tracked Combat Vehicles, 2034 - Ammunition, and 2035 - Other Procurement. At the start of each fiscal year, forecasts by monthly increments are required of the dollar value of orders accepted, commitments, and obligations. Forecasts are necessary to insure the availability of authority and funds to execute the customer program. Three types of control are exercised on some or all of the customer programs; namely, Funded Reimbursable Authority, Obligation Authority, and Foreign Program Control. Accurate forecasting of the customer program has proved to be very difficult in the past. Procedures and methods for improving the accuracy of projections are needed.

b. Related Studies. Two studies related to the current problem have been made in the recent past by the Logistics Studies Office, US Army Logistics Management Center. Both were sponsored by the DARCOM Security Assistance Center. The first was LSO Project 610, Estimating Time-Phased

Requirements for FMS Administrative Resources at the DARCOM Major Subordinate Commands; during this study a computerized simulation model was developed to project the costs of administering the FMS program. The second study was LSO Project 712, Forecasting FMS Procurement Funding Obligations, wherein it was hoped to modify the simulation model of Project 610 so as to permit forecasts of elements of the FMS customer program; the forecasts were to be based on historical trends and statistics. Project 712 was terminated because of an inadequate data base for determining how to model the FMS customer program; there was even some question as to whether one model would satisfy the needs of all GOAs.

2. Study Objectives and Scope.

a. Original Objectives. The original objectives of this study were documented on DD Form 1498 as follows:

(1) Overall objective: To develop a model for improving accuracy in forecasting FMS orders;

(2) Develop forecasting techniques to identify future FMS obligation requirements; and

(3) To validate obligation fund authority requests.

This original statement of study objectives restricted the study to the FMS program with major emphasis on obligation forecasting. The refinement of an existing computerized forecasting model was envisioned as the primary vehicle for the study.

b. Revised Guidance. This study commenced in August 1978 under the sponsorship of the DARCOM Director for Procurement and Production. Revised guidance as to scope of the study was received from the DARCOM Deputy

Commanding General for Resource Management during the fall of 1978. The scope was expanded to cover all three elements of the customer program; namely, Foreign Military Sales, the Military Assistance Program, and Other Customers. It was also expanded to cover predictions of orders accepted and commitments as well as of obligations.

c. Revised Objective. Based on the revised guidance, the study objective is to develop guidelines and techniques for improving the accuracy of projections of the Procurement Appropriation Customer Financial Plan. Emphasis on improvement through the use of computerized models has been relaxed, pending the establishment of automated data bases necessary for their development and use.

d. Scope. This study addresses performance in FY 77 and FY 78 and projections for FY 79 of the reimbursable customer programs impacting on the five Army procurement appropriations. Orders accepted, commitments, and obligations by appropriation and by customer type are analyzed.

### 3. Data Base Utilized in the Study.

a. Published Reports, Status of Procurement Appropriation Customer Financial Plan, RCS CSCAB-307.

(1) Schedule 307-11 as of October 1976, October 1977, August 1978, and October 1978.

(2) Schedule 307-21 as of December 1976, March 1977, June 1977, September 1977, December 1977, March 1978, June 1978, and September 1978.

b. Comments made by the comptroller representatives from eight DARCOM GOAs at the conference held 20 December 1978 at Headquarters DARCOM.



c. Guidance and information furnished by knowledgeable personnel in the Directorate for Procurement and Production, Headquarters, DARCOM.

d. Data and information gathered during conduct of the related studies described in paragraph 1b above.

4. Methodology Used in the Study.

a. The approach to the study consisted of three steps wherein numerical data was analyzed and a fourth step concurrent with the others wherein results of the numerical analyses and other information were used to formulate suggested techniques and procedures to improve forecasts. The three analytic steps were performed in the following sequence:

(1) The results of the October scrubbing of the August projections of the FY 79 customer program were examined. In August of 1978, the DARCOM GOAs made forecasts required for the 307-11 report, covering each of the 12 months of FY 79. In October 1978 the GOAs were requested to take a good look at the projections and update them. Guidance furnished the GOAs by the Director of Procurement and Production recommended that the revised forecast be reviewed by the Commander of the GOA; that information on the program be exchanged with Military Assistance Groups, the Security Assistance Center, other services and other commands; and that administrative lead times be reassessed. On 20 December 1978 at a meeting at Headquarters, DARCOM, a representative of the comptroller of each DARCOM GOA involved in the customer program discussed the reasons for projection changes. The first step therefore analyzed only changes in the FY 79 projections and the reasons therefore.

(2) The historical performance on the customer program for FY 77 and for FY 78 were next analyzed. First the accuracy of projections of the programs for those years was evaluated. Then quarterly trends of orders accepted, commitments, and obligations were examined for patterning and consistency.

(3) The projections for FY 79 made in October 1978 were evaluated, using the FY 77 and FY 78 experience as a basis for evaluation.

b. All numerical data taken from the RCS CSCAB-307 reports were in the form of dollar values. Thus, all tables, graphs, findings, and results are based on analyses of dollar values. Values shown in tables and graphs are normally in units of millions of dollars or in terms of percentage changes in dollar values.

c. The procurement appropriations have a 3-year limit for execution; however, this report uses data only from the first of the three execution years. The 7/9 appropriations are identified as FY 77 appropriations in the remainder of this report; the 8/0 appropriations are identified as FY 78, and the 9/1 appropriations as FY 79."

d. The RCS CSCAB-307 reports require customer program projections and actual performance reporting by monthly increments. The analyses in this study are based on quarterly projections and performance, rather than monthly. The reasons for this are (1) to permit easier identification of trends by smoothing out monthly variations, and (2) a belief that monthly projections will tend to be less accurate than quarterly projections.

5. Analysis and Discussion.

a. Analysis of Results of Scrubbing of the FY 79 Customer Program.

(1) Change in the Appropriation Projections. Each of DARCOM's General Operating Agencies (GOAs) made an original 307-11 projection in August 1978 and a revised projection in October-November 1978 (hereafter called the October projection) for the first year of the 9/1 Appropriations. The October projections of the FY 79 DARCOM totals for Orders Accepted (OAs), Commitments (COMs), and Obligations (OBLs) are shown in Table 1 along with the percentage change in the projection from the August figure. Negative percentages in Table 1 represent a lower projection in October than in August. Although some of the individual appropriations show considerable change, the net effect of the scrubbing on DARCOM totals is not very significant. Overall, there was a 3.3 percent decrease in projected OAs, a 10.1 percent decrease in projected commitments and a 6.4 percent decrease in projected obligations. Figures 1-1 and 1-2 present a graphic portrayal of the results of the scrubbing effort. The original quarterly projections of OAs, COMs, and OBLs for each appropriation and the revised projections are presented side-by-side for easy comparison.

(2) Scrubbing of OA Projections and Causes Thereof. In Table 2 is shown a detailed summary of the OA projections of August and October by GOA. On 20 December 1978, comptroller representatives from each of the eight GOAs contributing to the customer program met at DARCOM to discuss the 307-11 forecasts. The explanations offered by the representatives of each GOA for the major changes in projections between August and October are presented below. (It should be noted that the US Army Tank-Automotive Materiel

TABLE 1  
SUMMARY OF RESULTS OF SCRUBBING OF FY 79 PROJECTIONS

Appropriation	Orders Accepted (OAs)		Commitments (COMs)		Obligations (OBLs)	
	Oct Proj. (\$000's)	Percent Change	Oct Proj. (\$000's)	Percent Change	Oct Proj. (\$000's)	Percent Change
2031	74,985	-20.5	68,665	-23.8	19,926	-75.7
2032	498,403	+ 0.5	405,063	-18.1	354,389	+12.4
2033	414,008	-17.9	355,120	-23.1	311,326	-21.3
2034	477,963	+ 8.9	437,678	+ 9.4	361,407	+ 4.8
2035	266,100	+ 3.4	257,115	+ 3.8	212,595	+ 2.1
TOTAL	1,731,459	- 3.3	1,523,641	-10.1	1,259,543	- 6.4



COMPARISON OF PROJECTIONS OF FY 79 PROGRAM  
MADE IN AUGUST AND OCTOBER 1978

All Scales in Millions of Dollars

KEY: — Orders Accepted  
— Commitments  
--- Obligations

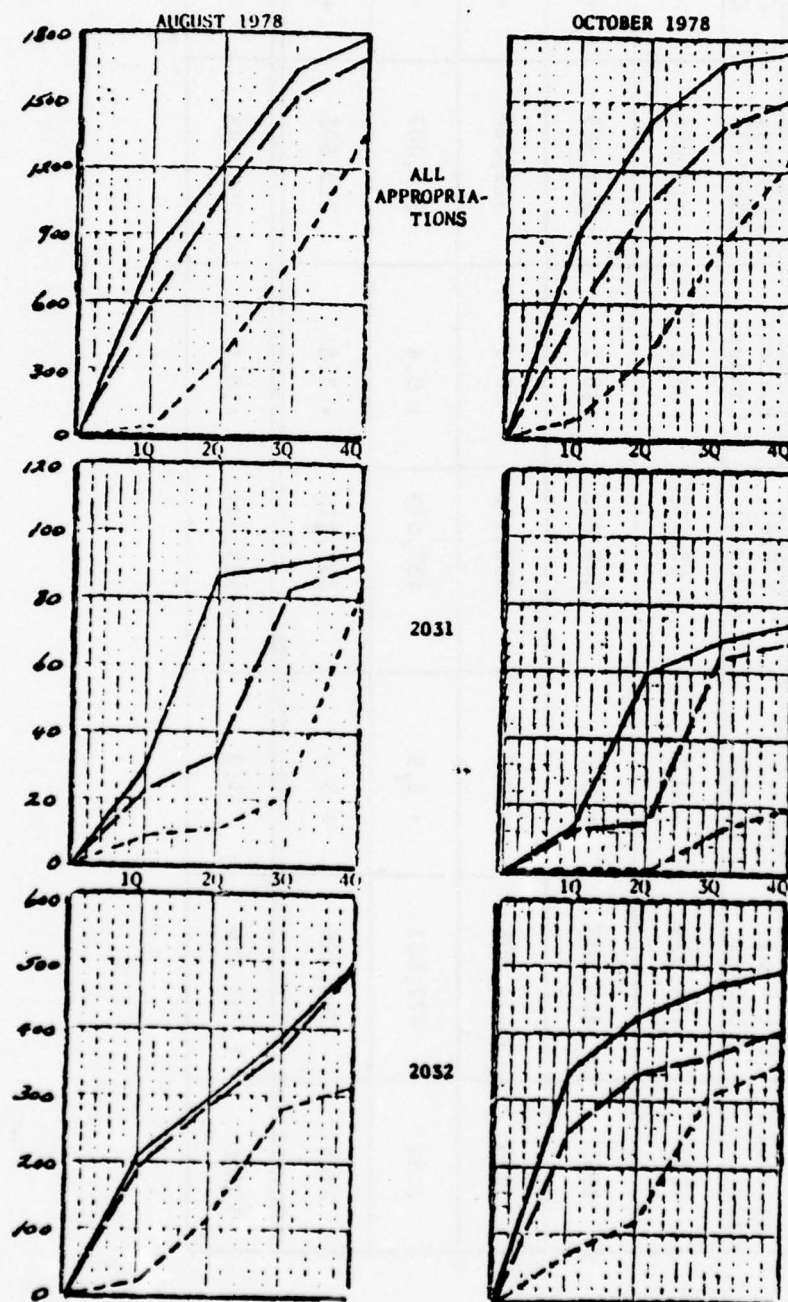


FIGURE 1-1.

COMPARISON OF PROJECTIONS OF FY 79 PROGRAM  
MADE IN AUGUST AND OCTOBER 1978 (CONT)

All Scales in Millions of Dollars

KEY: ——— Orders Accepted  
——— Commitments  
- - - Obligations

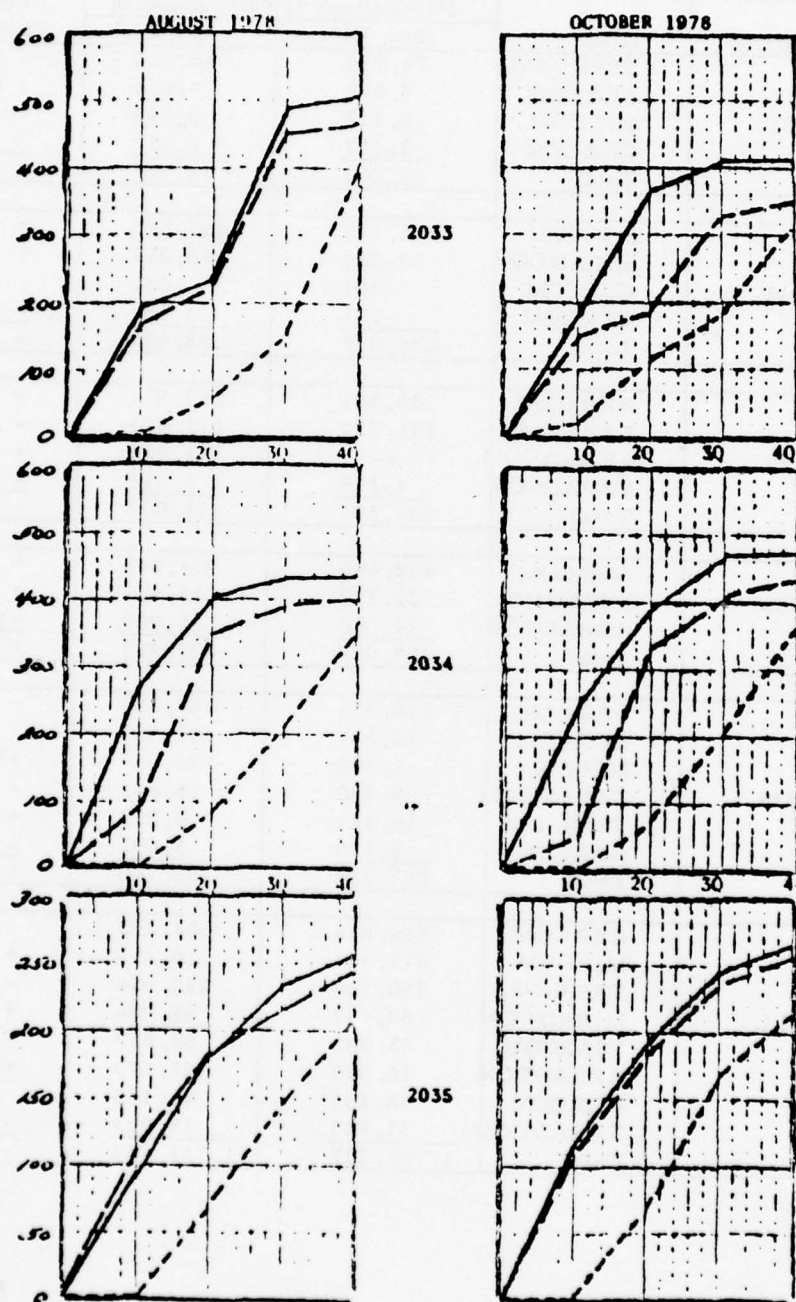


FIGURE 1-2.

Table 2

DETAILED SUMMARY OF RESULTS OF SCRUBBING  
THE PROJECTIONS OF FY 79 ORDERS ACCEPTED

Approp.	GOA	Projections (\$000s) Made In		Percent Change
		Aug 78	Oct 78	
2031	TSARCOM	76,959	54,335	- 29.4
	ARRCOM	7,099	9,684	+ 36.4
	MIRCOM	8,115	8,849	+ 9.0
	CERCOM	<u>2,117</u>	<u>2,117</u>	<u>0.0</u>
	Total	94,290	74,985	- 20.5
2032	MIRCOM	466,717	467,647	+ 0.2
	MIRADCOM	28,720	30,063	+ 4.7
	CERCOM	441	441	0.0
	ARRCOM	<u>157</u>	<u>252</u>	<u>+ 60.5</u>
	Total	496,035	498,403	+ 0.5
2033	ARRCOM	308,581	257,972	- 16.4
	TARCOM	191,750	131,224	- 31.6
	ARRADCOM	-	21,500	+ -
	TARADCOM	<u>4,175</u>	<u>3,312</u>	<u>- 20.7</u>
	Total	504,506	414,008	- 17.9
2034	ARRCOM	402,446	411,042	+ 2.1
	MIRADCOM	21,712	35,921	+ 65.4
	ARRADCOM	<u>14,900</u>	<u>31,000</u>	<u>+108.0</u>
	Total	439,058	477,963	+ 8.9
2035	TARCOM	158,350	158,350	0
	CERCOM	43,587	43,587	0
	MIRCOM	1,132	33,917	+2896.2
	TARADCOM	29,560	15,641	- 47.1
	TSARCOM	16,124	9,202	- 42.9
	ARRCOM	<u>8,595</u>	<u>5,403</u>	<u>- 37.1</u>
	Total	257,338	266,100	+ 3.4
ALL	ARRCOM	726,878	684,353	- 5.8
	MIRCOM	475,964	510,413	+ 7.2
	TARCOM	350,100	289,574	- 17.3
	MIRADCOM	50,432	65,984	+ 30.8
	TSARCOM	93,083	63,537	- 31.7
	ARRADCOM	14,900	52,500	+252.4
	CERCOM	46,145	46,145	0
	TARADCOM	<u>33,725</u>	<u>18,953</u>	<u>- 43.8</u>
	Total	1,791,227	1,731,459	- 3.3

Readiness Command (TARCOM) revised its October projections upward at the time of the December meeting. The result was a higher projection of total DARCOM OAs than was originally forecast in August.)

(a) Appropriation 2031.

1. Contribution of Each GOA. Four commands contribute to this appropriation; breakout of percentage contributed to the October projection of OAs by each GOA is as follows:

TSARCOM	72.5%
ARRCOM	12.9%
MIRCOM	11.8%
CERCOM	<u>2.8%</u>
TOTAL	100.0%

2. Scrub of OAs. The decrease of 20.5 percent in OAs was the net effect of a large dollar decrease in the TSARCOM projection and smaller dollar increases in the ARRCOM and MIRCOM projections. No change was made by CERCOM in its projection. The TSARCOM decrease resulted primarily from a reduction of \$30M in MAP. This amount was included in the August forecast based on experience in previous years; however, the MAP value now is expected to be very small. The increases in ARRCOM and MIRCOM projections were the result of a careful reevaluation.

3. Discrepancies Between Change in OAs and Change in Commitments and Obligations. The 20.5 percent decrease in OAs was accompanied by a matching 23.8 percent decrease in commitments. Obligations, however, underwent a 75.7 percent decrease. This resulted from one TSARCOM pending case for \$40M (more than half the total October projection). In August, this case was forecast for acceptance, commitment, and obligation in FY 79.



However, the case is still pending and though acceptance and commitment are expected in FY 79, actual obligation is not expected to occur until FY 80.

(b) Appropriation 2032.

1. Contribution of Each GOA. Four commands contribute to this projection; breakout of percentage contributed to the October projection of OAs by each GOA is as follows:

MIRCOM	93.8%
MIRADCOM	6.0%
CERCOM	0.1%
ARRCOM	<u>0.1%</u>
TOTAL	100.0%

2. Scrub of OAs. Small dollar increases in OAs were made by all GOAs but CERCOM, which forecast no changes in any projection. The net OA change overall was an increase of 0.5 percent.

3. Discrepancies Between Change in OAs and Change in Commitments and Obligations. While OAs increased only 0.5 percent, commitments decreased 18.1 percent, and obligations increased 12.4 percent. Discrepancies are due to MIRCOM changes in projections as follows (all figures in millions of dollars):

	<u>OAs</u>	<u>COMs</u>	<u>OBLs</u>
August	\$466.7	\$466.7	\$287.4
October	<u>\$467.6</u>	<u>\$375.4</u>	<u>\$324.7</u>
Change	+\$0.9	-\$91.3	+\$37.3

Per the MIRCOM Comptroller representative, the decrease in commitments was due to correction of errors and the increase in obligations was due to a more realistic appraisal.

(c) Appropriation 2033.

1. Contribution of Each GOA. Four commands contribute to this appropriation in the following percentages based on the October projections of OAs:

ARRCOM	62.3%
TARCOM	31.7%
ARRADCOM	5.2%
TARADCOM	<u>0.8%</u>
TOTAL	100.0%

2. Scrub of OAs. The projection of OAs decreased approximately \$90M. This is the net result of reductions of \$60M, \$51M, and \$1M by TARCOM, ARRCOM, and TARADCOM, respectively, and of a new requirement from ARRADCOM of \$22M. (1) The TARCOM reduction of \$60M was not explained, except to indicate that the program is constantly changing and accurate projections are very difficult. (The TARCOM representative said the October projection was no longer valid as of 20 December, and his presentation addressed the change between October and December, not the changes between August and October. See paragraph 4. below for December figures.) (2) The ARRCOM reduction of \$51M resulted from fewer FMS orders materializing than expected and from expeditious processing in September which put some orders in the FY 78 program rather than in the FY 79 program. (3) The \$22M ARRADCOM projection was new and was the result of a Marine Corps order which was unknown in August.

3. Discrepancies Between Changes in OAs and Change in Commitments and Obligations. Although projected OAs dropped by 17.9 percent, commitments dropped 23.1 percent, and obligations 21.3 percent. The changes came about

because both TARCOM and ARRCOM reduced the percent of OAs they expect to require commitment action while TARCOM forecasted higher obligations as a percent of commitments.

4. December Revision of Projections. By the time of the 20 December meeting, TARCOM had revised its October figures. The projections for TARCOM (in millions of dollars) are:

	<u>OAs</u>	<u>COMs</u>	<u>OBLs</u>
August	\$191.8	\$184.2	\$154.4
October	\$131.2	\$123.6	\$110.9
December	\$183.4	\$144.4	\$120.8

The resultant effect on Appropriation 2033 between August and December is a 7.6 percent decrease in OAs, an 18.6 percent drop in commitments, and an 18.8 percent drop in obligations.

(d) Appropriation 2034.

1. Contribution of Each GOA. Three commands contribute to this appropriation in the following percentages based on the October OA projections:

ARRCOM	86.0%
MIRADCOM	7.5%
ARRADCOM	<u>6.5%</u>
TOTAL	100.0%

2. Scrub of OAs. The increase of 8.9 percent in projected OAs was caused by relatively minor dollar increases in the projections of all three commands. This appropriation has the smallest percentage due to FMS and to MAP of the five appropriations. Two-thirds of the projected OAs are for other customers than FMS and MAP. ARRADCOM has no FMS or MAP orders; such are handled by the Readiness Command (ARRCOM). The increase in the ARRADCOM

projection was caused by the expectation that the US Air Force will release a pending program. MIRADCOM projections are for one item only, the 2.75 Rocket, with some FMS and some Other Customer orders projected. Changes resulted from routine reevaluation of pending cases.

3. Discrepancies Between Changes in OAs and Changes in Commitments and Obligations. No significant discrepancy exists between the increases of 8.9 percent in Orders Accepted, 9.4 percent in commitments, and 4.8 percent in obligations.

(e) Appropriation 2035.

1. Contribution of Each GOA. Six commands contribute to this appropriation in the following percentages based on the October projections of OAs:

TARCOM	59.5%
CERCOM	16.4%
MIRCOM	12.7%
TARADCOM	5.9%
TSARCOM	3.5%
ARRCOM	<u>2.0%</u>
TOTAL	100.0%

2. Scrub of OAs. No change in OA projection was made by either TARCOM or CERCOM, the two largest contributors to Appropriation 2035. The overall increase of 3.4 percent in OAs is the result of an increase of \$30 million in the MIRCOM forecast for Other Customers and somewhat compensating decreases by TARADCOM, TSARCOM, and ARRCOM.

3. Discrepancies Between Changes in OAs and Changes in Commitments and Obligations. No significant discrepancy exists between the increase of 3.4 percent in OAs, 3.8 percent in commitments, and 2.1 percent in obligations.



4. December Revision of Projections. By the time of the 20 December meeting, TARCOM had revised its October projection. The projections for TARCOM (in millions of dollars) are:

	<u>OAs</u>	<u>COMs</u>	<u>OBLs</u>
August	\$158,350	\$157,014	\$128,752
October	\$158,350	\$157,014	\$127,900
December	\$172,878	\$171,600	\$120,500

The resultant effect on Appropriation 2035 between August and December is a 9.0 percent increase in OAs, a 9.7 percent increase in commitments, and a 1.4 percent decrease in obligations. No significant reasons other than possession of later information were given for the changes.

(3) Observations Made by General Operating Agency Comptroller Representatives. At the 20 December 1978 meeting, the GOA Comptroller representatives made the following observations regarding problems in the 307-11 forecasts.

(a) There was repeated emphasis on the inappropriateness of statistical forecasting techniques for two reasons. First, the R&D commands have little or no historical basis from which to project. Second, for several commands the customer business involves only a small number of cases of very high value; statistical projections do not work well in such situations.

(b) There are too many controls on the customer program and too few people to administer it. Time delays are encountered in getting the three releases needed; namely, Funded Reimbursable Authority, Foreign Program Control, and Obligation Authority.

(c) Compliance with the Memorandum issued on 17 June 1977 by the Assistant Secretary of Defense, subject: Financial Management of the

Foreign Military Sales Program, (commonly called the WACKER Memo), has immeasurably complicated the customer program.

(d) Four different unsynchronized forecasts of obligations must be made; namely, for the P-4, the 307-11, the Army Customer Order Control System (ACOCS), and the Army Procurement Appropriation Reporting System.

(e) The various management information systems that contain data regarding the customer program are each independent and fail to properly interface with one another.

(f) The existence of very high-dollar cases complicates the forecasting since acceptance or rejection can radically change the forecast. One Iran case, for instance, is for \$186M, a value greater than 10 percent of the year's projected OA total. Political unrest in some foreign countries is a complicating factor at present, both as regards accepted as well as pending cases.

(g) Other problems include the changing definition of an "order" (actionable in the same FY versus actual), the question of whether depot rebuild programs are considered as part of the Procurement Appropriation or as part of the Operations and Maintenance Appropriation, and the significant time delays in customer programs when price adjustments occur at current contract expiration dates and customer approval of increases must be obtained.

(4) Discussion and Observations Based on the Scrubbing Operations.

(a) Based on the figures shown in Tables 1 and 2 above and on the comments made by the GOA comptroller representatives, it appears that little change in forecasting methodology was instituted between August and

October 1978. Rather, the October projections reflect a correction of errors and a simple updating of the August data base from the later date vantage point.

(b) Projection of the total volumes of FMS OAs for a year should be based on orders already on hand, orders pending, or orders developing (that is, the Letter of Offer and Acceptance (LOA) has not yet been furnished the customer). This is the method currently used by the GOAs in developing the major portion of the customer program. This method should result in more accurate projections than statistical forecasting based solely on historical trends, because of the unpredictability of customer business and the existence of very high-dollar value cases.

b. Analysis of the Historical Record of FY 77 and FY 78.

(1) Approach Used. In analyzing the historical record, interest centers on two areas. First the accuracy of projections made in the earlier years is of interest since this may provide some basis for evaluating the accuracy of the FY 79 projections. The accuracy of projections only of orders accepted is analyzed; this is because the volume of orders accepted is the "driver" of commitments and obligations. Inaccuracies in projections of dollar values of commitments and obligations will reflect not only misjudgments as to potential performance in committing and obligating accepted orders, but also reflect inaccuracies in the projections of the orders themselves. The second area of interest is the time-phased pattern, quarter-by-quarter through the year, of orders accepted, commitments and obligations. The reason for this interest was to determine whether these

patterns were consistent between FY 77 and FY 78; if so, they possibly provide a basis for evaluating the projected time-phasing of performance for FY 79. Because of the dependence of commitment and obligation performance at any point on the value of orders accepted up to that point, commitment and obligation time patterns are expressed in terms of percentages. Since commitment implies an accepted order, commitments as a percent of orders accepted are analyzed. Similarly since obligation implies a commitment, obligations are analyzed as a percent of commitments.

(2) Accuracy of Projections of the FY77 and FY 78 Customer Programs.

The 307-11 reports of 31 October 1976 and 31 October 1977 contained projections of the yearly total of orders accepted for FY 77 and FY 78, respectively. The 307-21 reports of 31 September 1977 and 31 September 1978 contained the actual values of orders accepted during those years. Projections and actual performance in the two years are compared graphically in Figures 2 through 5, both by appropriation and by customer type. From Figures 2 and 4, it is apparent that projections in both years exceed actual orders received. DARCOM-wide, only 57 percent of the dollar value of FY 77 projected orders was realized and only 76 percent of FY 78 projected orders. Except for Appropriation 2034 in FY 77, all individual appropriation forecasts in both years exceeded the actual value of orders accepted. From Figures 3 and 5, it is apparent that the overestimation was principally on FMS orders; MAP and Other Customer orders were quite accurately forecasted. The FMS graphs of Figures 3 and 5 lead to the observation that the FMS orders projected for the end of the second quarter



ACCURACY OF PROJECTION OF ORDERS ACCEPTED  
BY APPROPRIATION - FY 77

All Scales in Millions of Dollars

KEY: ——— Actual  
----- Projected

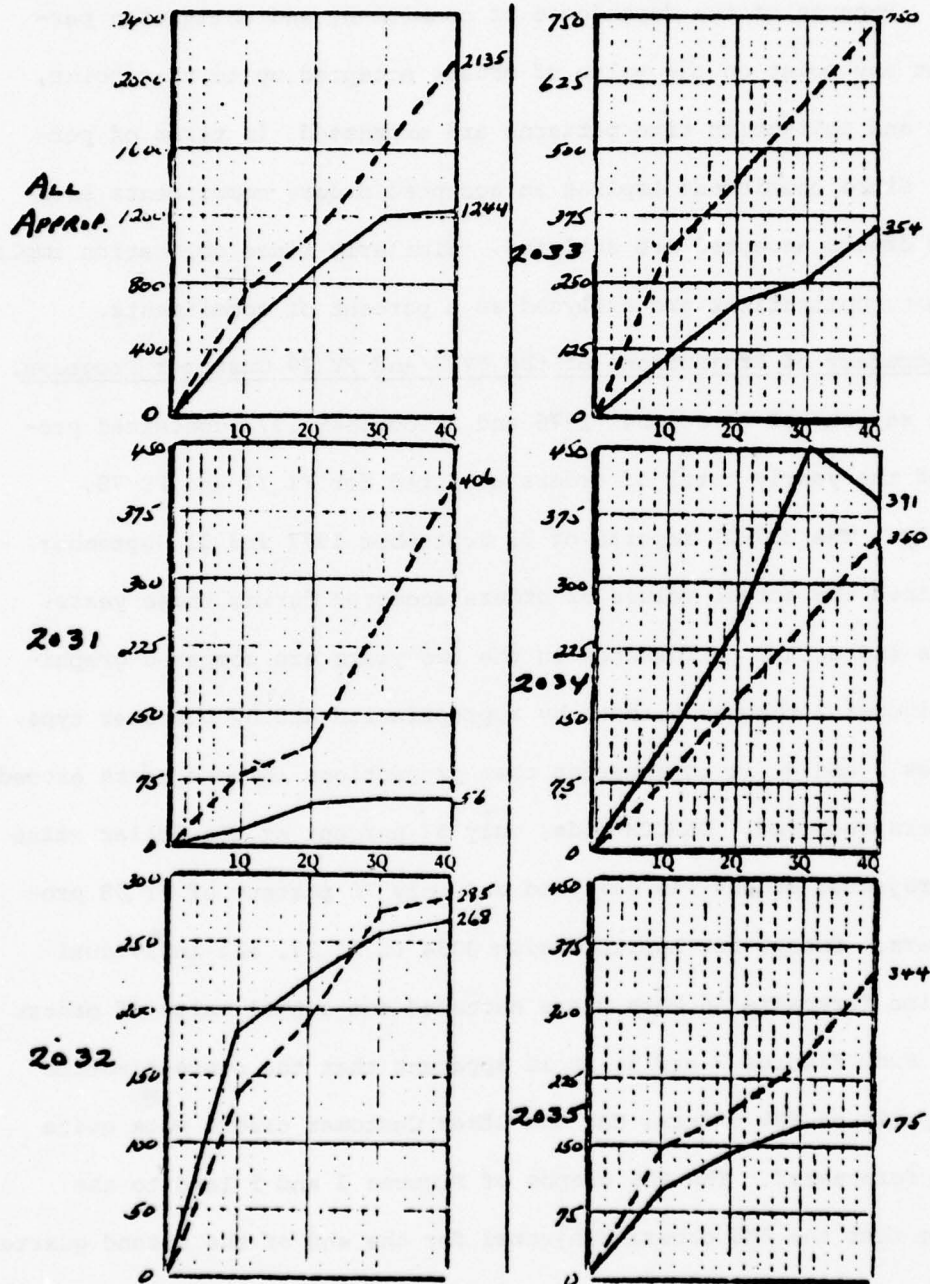


FIGURE 2.

ACCURACY OF PROJECTION OF ORDERS ACCEPTED  
BY CUSTOMER TYPE - FY 77

All Scales in Millions of Dollars

KEY: ————— Actual  
----- Projected

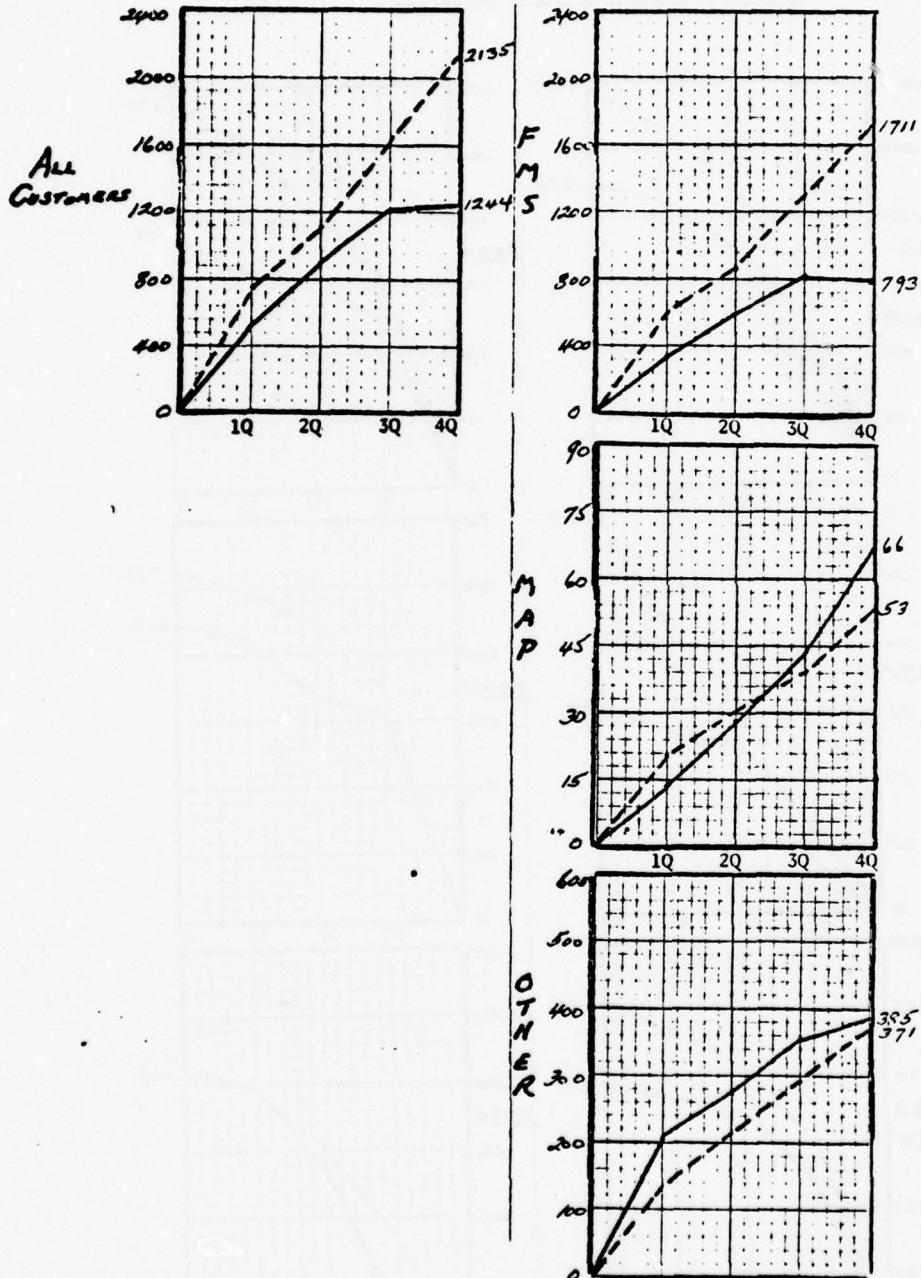


FIGURE 3.

ACCURACY OF PROJECTION OF ORDERS ACCEPTED  
BY APPROPRIATION - FY 78

All Scales in Millions of Dollars

KEY: ——— Actual  
----- Projected

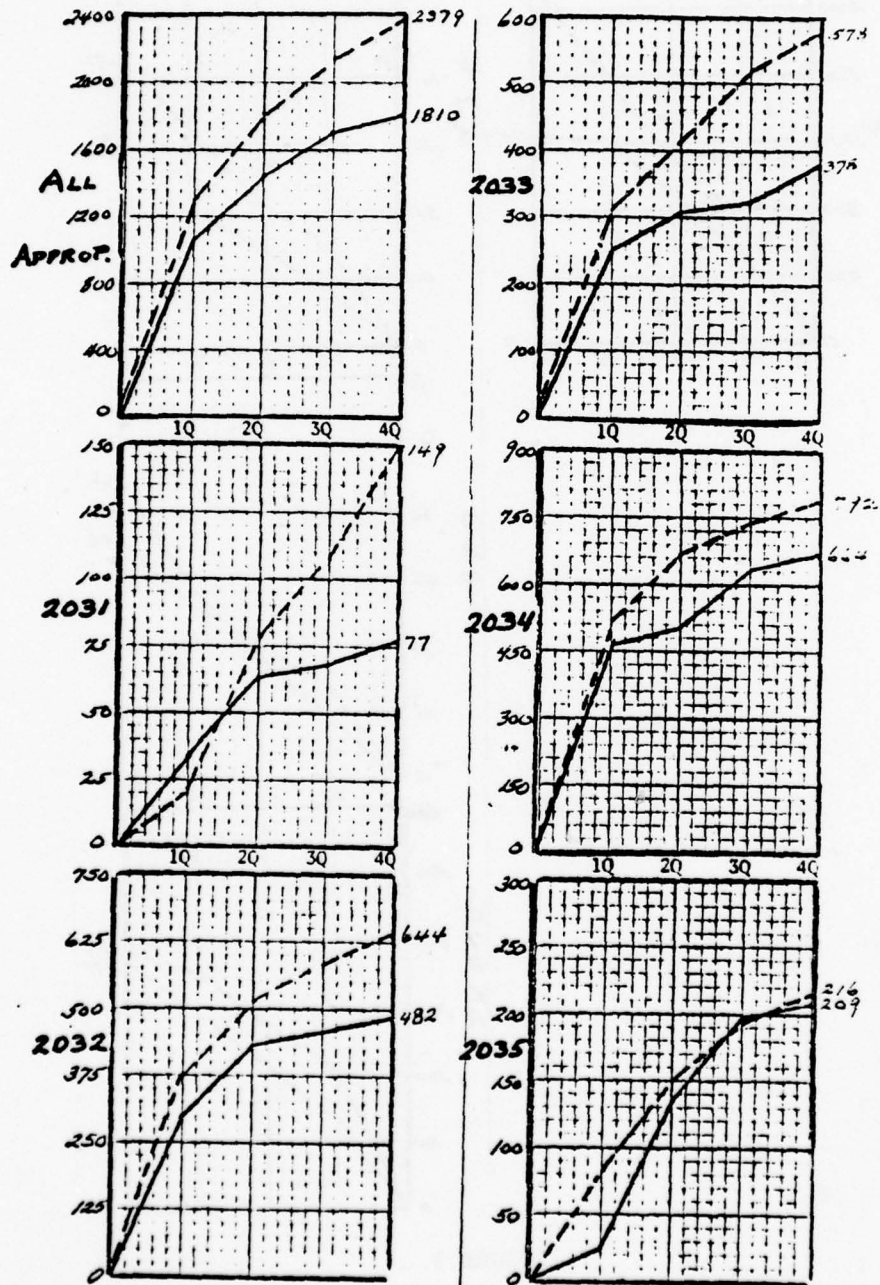


FIGURE 4.

ACCURACY OF PROJECTION OF ORDERS ACCEPTED  
BY CUSTOMER TYPE - FY 78

All Scales in Millions of Dollars

KEY: ——— Actual  
----- Projected

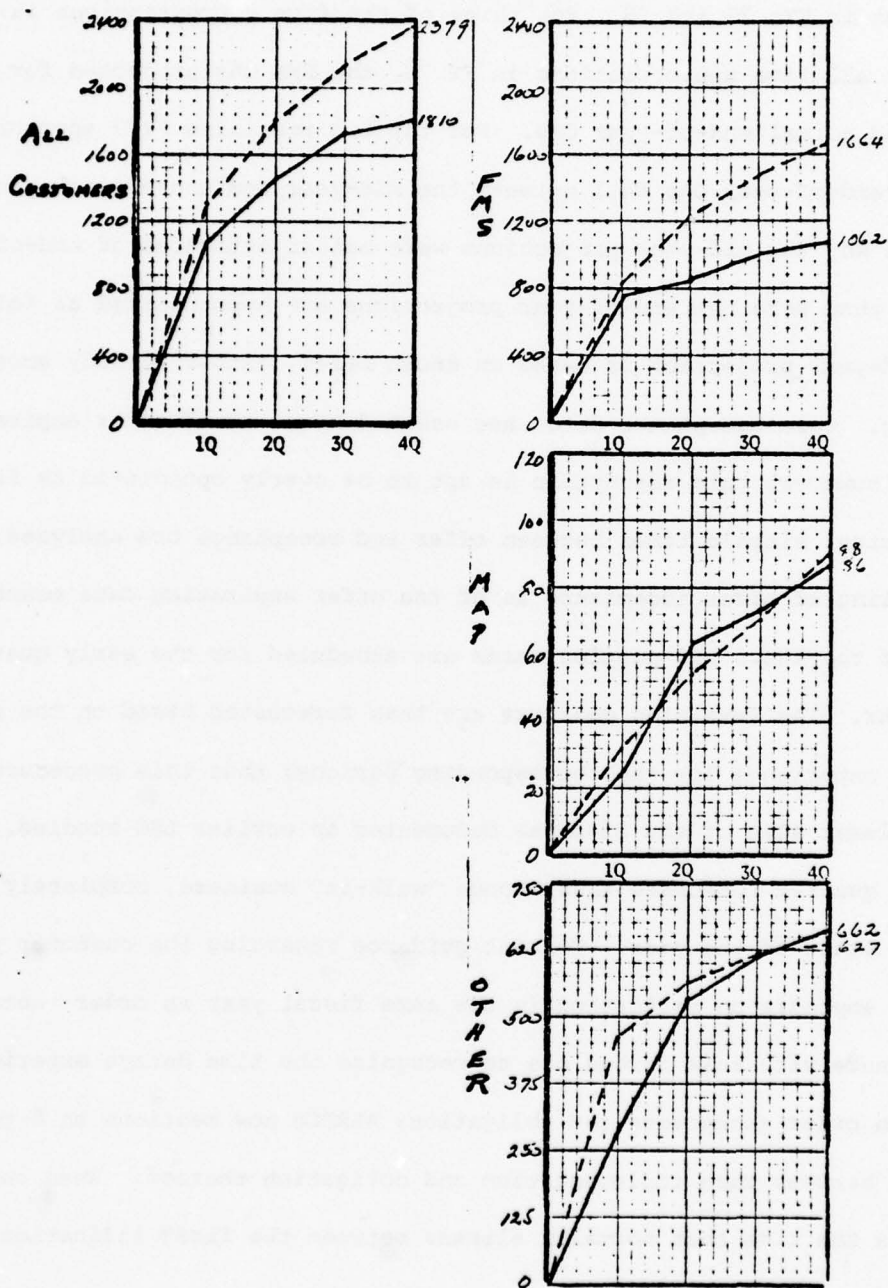


FIGURE 5.



were closer to the orders actually received by year-end than were the end-of-year projections. Table 3 compares the mid-year and end-of-year FMS projections with actual FMS orders accepted by end-of-year for each appropriation in FYs 77 and 78. For three of the five appropriations in FY 77 and for all five appropriations in FY 78, the FMS OAs projected for mid-year exceeded actual end-of-year OAs. For the two remaining FY77 appropriations, actual end-of-year OAs fell between the mid-year and end-of-year projections. Reasons why the mid-year projections were better estimates of end-of-year actual than were the end-of-year projections are hypothesized as follows. The mid-year projection is based on known cases, either already accepted or pending. Case acceptance dates are assumed to be as of offer expiration date. However, this assumption is apt to be overly optimistic as is clear when actual elapsed times between offer and acceptance are analyzed. The scheduling of offer acceptance as of the offer expiration date means that most of the known and pending cases are scheduled for the early quarters of the year. The remaining quarters are then forecasted based on the previous year's experience for the corresponding periods; that this procedure is used by at least some of the GOAs was documented in earlier LSO studies. These latter quarter forecasts thus become "walk-in" business, completely unknown at the start of the year. Current guidance regarding the customer program places emphasis on obligation in the same fiscal year as order acceptance. Compliance with this forces one to recognize the time delays experienced between order acceptance and obligation; ARRCOM now mentions an 8-month period between case implementation and obligation thereof. When one adds to this the time that normally elapses between the first indication of FMS

TABLE 3

## ACCURACY OF PROJECTION OF THE FMS ORDERS IN FY 77 AND FY 78

FY	Appropriation	FMS Orders Accepted (\$ Millions)		
		Projected		Actual End-of-Year
		For Mid-Year	For End-of-Year	
77	2031	96.7	372.6	27.1
	2032	155.6	247.7	215.1
	2033	363.9	610.2	290.5
	2034	101.5	213.8	165.8
	2035	154.2	266.8	95.0
	ALL	871.9	1711.1	793.5
78	2031	53.7	108.3	32.2
	2032	423.4	545.7	387.7
	2033	325.4	467.1	289.5
	2034	305.6	404.1	284.4
	2035	101.9	138.8	68.2
	ALL	1210.0	1664.0	1062.0

customer interest and case implementation, it appears most unlikely that an FMS case entirely unknown at the start of an FY could reach obligation by the end of the same FY. This then causes one to observe that forecasts of the total FMS program for the year should be based only on customer interests known at the start of the year, suitably decremented according to historical offer rejection rates. There appears to be little or no need to forecast any "walk-in" FMS business. On the other hand, there does appear to be some necessity to realistically evaluate whether cases in the pre-offer stages of negotiation at the start of a year, that is, developing cases, should be scheduled for acceptance in that FY or the following FY.

(3) Time-Phasing of Orders Accepted. Data was extracted from the 307-21 reports in order to examine the time-phasing of orders accepted by quarter. Cumulative percentages of orders accepted by quarter are shown in Table 4, both by appropriation and by customer type. (The third quarter percentages which exceeded 100 percent in 1977 were caused by a subsequent "write-down" of unobligated orders at the close of FY 77; this action reduced the year's total to below the value shown on the records as of the end of the third quarter.) Orders were not received at an even rate during the preceding years. In general, the largest percentage of order value acceptance came in the first quarter with smaller percentages in each succeeding quarter. In FY 77, 71 percent of the year's total order value was accepted by mid-year; in FY 78, 80 percent had been accepted by mid-year. Acceptances in the last quarter have been minimal. DARCOM-wide, the pattern of order value receipt over the two years has been approximately 50 percent in the first quarter, 25 percent in the second quarter, 20 percent in the third,

TABLE 4

CUMULATIVE PERCENT OF ORDERS ACCEPTED  
BY QUARTER - FY 77 AND FY 78

FY	Appropriation/Customer	Total Orders Accepted (\$ Millions)	Cumulative Percent of Orders Accepted by End of			
			1Q	2Q	3Q	4Q
77	2031	56.3	37	91	102	100
	2032	268.3	68	83	96	100
	2033	353.9	32	61	73	100
	2034	391.3	32	66	117	100
	2035	175.1	58	79	98	100
	FMS	793.5	41	73	101	100
	MAP	66.4	21	43	67	100
	Other	385.0	53	71	92	100
	TOTAL	1244.9	44	71	97	100
78	2031	76.8	44	83	90	100
	2032	482.0	62	89	95	100
	2033	377.9	67	81	87	100
	2034	664.5	69	77	95	100
	2035	208.9	13	65	95	100
	FMS	1062.0	69	80	95	100
	MAP	86.3	29	71	85	100
	Other	661.8	48	80	92	100
	TOTAL	1810.1	59	80	93	100



and only 5 percent in the last quarter. The major factor causing acceptance of the preponderance of order dollars in the early part of the fiscal year is thought to be the emphasis on obligating in the same fiscal year that an order is accepted. The seven or eight month lapse between case implementation and obligation makes the acceptance of orders in the latter part of the FY rather unlikely. Rather, such orders are held until the next FY for acceptance and therefore contribute to the order influx in the early quarters.

(4) Time-Phasing of Commitments. Cumulative commitments are analyzed as a percent of cumulative orders accepted by the end of each quarter since there must be an accepted order before a commitment is possible. It must be noted that not all orders will result in a commitment; only those customer orders rated RS, RP, and CP require commitment and obligation. (See Appendix C for explanation of order classification codes.) However, orders not requiring commitment have represented only a very minor portion of total OAs in the last two years--5.6 percent in FY 77 and only 0.5 percent in FY 78. Therefore, in computing commitments as a percent of Orders Accepted, the value of OAs has not been adjusted to compensate for the small portion of order value not requiring a commitment action. Another reason for not adjusting OAs is that the FY 79 projections of OAs include such orders with no basis provided for estimating their relative value; therefore, evaluations of the FY 79 projections must be based on performance on all OAs in previous years. In Table 5 are shown the value of cumulative commitments at the end of each quarter as a percent of cumulative OAs by the same point in time. From the data in Table 5, a general pattern is evident wherein commitment

TABLE 5

CUMULATIVE COMMITMENTS AS A PERCENT OF CUMULATIVE  
ORDERS ACCEPTED - FY 77 AND FY 78

FY	Appropriation/ Customer	Commitments As a Percent of OAs			
		1Q	2Q	3Q	4Q
77	2031	60	71	73	82
	2032	59	71	73	97
	2033	35	46	61	92
	2034	24	42	48	85
	2035	44	64	76	85
	FMS	35	49	52	89
	MAP	76	60	66	78
	Other	54	69	82	91
	TOTAL	43	55	61	89
78	2031	83	74	84	84
	2032	77	88	92	95
	2033	25	58	67	95
	2034	43	63	67	79
	2035	22	72	74	84
	FMS	38	69	71	87
	MAP	75	63	73	74
	Other	72	75	82	89
	TOTAL	49	71	75	87

performance improves as the year advances. For example, DARCOM-wide in FY 77, only 43 percent of the value of orders accepted by the end of the first quarter had been committed; 55 percent of orders accepted up to mid-year had been committed by the end of the second quarter; and so on. This pattern is as would be expected when one remembers the pattern of receipt of orders through the year. The large influx of orders in the early part of the year renders it difficult to keep commitments abreast with orders; reduced order volume in the latter part of the year permits commitments to catch up. Considerable variation exists between the patterns of the individual appropriations; however, within an appropriation, the data for each of the two fiscal years are more consistent. The fourth quarter percentages show good consistency between appropriations as well as within appropriations. In FY 77, 89 percent of total order value was committed by year end, and in FY 78, 87 percent had been committed.

(5) Time-Phasing of Obligations. Cumulative obligations by the end of each quarter are analyzed as a percent of cumulative commitments at the same point in time; Table 6 displays the data for FY 77 and FY 78. The DARCOM-wide pattern in the two preceding years is such that approximately two-thirds of the dollar value committed by the end of each of the first three quarters has been obligated, and that 90 percent of commitments have been obligated by year end. Thus, approximately 78 percent of the total order value in each of the two preceding years was obligated by the end of the first year of the appropriation's three-year life. Patterns for the individual appropriations show considerable variation between one another and also between the two years within an appropriation, whereas the aggregate

TABLE 6

CUMULATIVE OBLIGATIONS AS A PERCENT  
OF CUMULATIVE COMMITMENTS  
FY 77 AND FY 78

FY	Appropriation/ Customer	Obligations as a Percent of Commitments			
		1Q	2Q	3Q	4Q
77	2031	87	46	63	85
	2032	66	63	84	86
	2033	78	71	60	88
	2034	49	43	47	91
	2035	65	64	73	86
	FMS	58	54	63	86
	MAP	90	71	81	85
	Other Customers	74	65	66	92
	TOTAL	67	59	65	88
78	2031	33	57	58	90
	2032	73	77	83	96
	2033	69	73	80	91
	2034	59	65	77	91
	2035	30	35	42	69
	FMS	59	70	80	92
	MAP	50	44	63	88
	Other Customers	72	** 65*	69	86
	TOTAL	64	68	75	90



pattern over all appropriations shows good consistence between the two years.

(6) Discussion and Observations Regarding Performance in FY 77 and FY 78.

(a) Projections of total customer order value to be accepted in FY 77 and FY 78 were considerably higher than the values actually realized. This overestimation was primarily in FMS projections; projections for MAP and Other Customers were within an acceptable range of accuracy.

(b) The projections of FMS order value to be accepted by the end of the second quarter were much closer to the actual year-end order value than were the projections of end-of-year value.

(c) Forecasts of the total FMS customer order value for a year should be based solely on cases known, pending, or under development at the start of the year.

(d) Quarterly performance patterns in each of the two preceding years have been fairly consistent, at least on a DARCOM-wide level over all appropriations. In Figure 6 are compared the FY 77 and FY 78 quarterly patterns, DARCOM-wide, of order value acceptance, of commitments as a percent of orders, and of obligations as a percent of commitments. Sufficient consistency exists that the patterns are considered a suitable basis for evaluating the patterns projected for FY 79.

c. Evaluation of the FY 79 Projections.

(1) Total Customer Program Value. In Table 7 is presented a comparison, by type of customer within each appropriation, of the value of orders

PATTERNS OF QUARTERLY PERFORMANCE  
FY 77 AND FY 78

ALL APPROPRIATIONS - ALL CUSTOMERS

KEY: — FY 77  
- - - FY 78

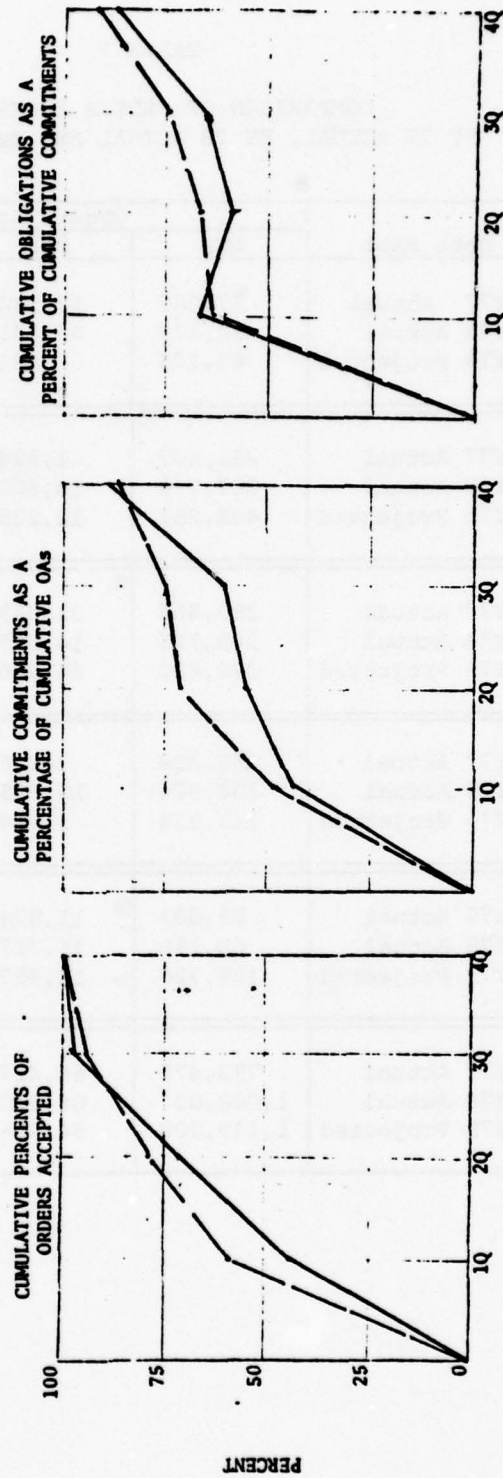


FIGURE 6.

TABLE 7

COMPARISON OF ORDERS ACCEPTED --  
 FY 77 ACTUAL, FY 78 ACTUAL AND FY 79 PROJECTED

Appropriation	Data Base	Orders Accepted (\$000s)			
		FMS	MAP	Other	Total
2031	FY77 Actual	27,085	17,524	11,632	56,241
	FY78 Actual	32,173	30,171	14,407	76,751
	FY79 Projected	60,273	584	14,128	74,985
2032	FY77 Actual	215,107	1,954	51,222	268,283
	FY78 Actual	387,770	14,680	79,520	481,970
	FY79 Projected	456,261	12,225	29,917	498,403
2033	FY77 Actual	290,467	32,069	31,377	353,913
	FY78 Actual	289,525	14,857	73,558	377,940
	FY79 Projected	346,820	24,486	42,702	414,008
2034	FY77 Actual	165,808	3,006	222,512	391,326
	FY78 Actual	284,374	10,875	369,281	664,530
	FY79 Projected	145,934	2,934	329,095	477,963
2035	FY77 Actual	95,003	11,874	68,232	175,109
	FY78 Actual	68,195	15,717	125,024	208,936
	FY79 Projected	109,720	14,557	141,823	266,100
ALL	FY77 Actual	793,470	66,427	384,975	1,244,872
	FY78 Actual	1,062,037	86,300	661,790	1,810,127
	FY79 Projected	1,119,008	54,786	557,665	1,731,459

accepted in FYs 77 and 78 and those projected for FY 79 (as of the October 1978 revision). In presenting this comparative data, it is not to be inferred that the historical order values are considered a suitable basis for evaluating the projections. As emphasized in paragraph 5a(4)(b) above, more accurate projections of the total order value for a year are to be expected from current knowledge of customer plans than from an historical trend. In fact, a close examination of the data in Table 7 uncovers very few instances where the projection for FY 79 could be said to follow the trend set in FYs 77 and 78. The estimates of year-end order values have been in the past, and must continue to be, based on hard knowledge of current interests of customers. This is not to imply, however, that historical case rejection rates, past individual customer performance, historical elapsed times to develop cases, or even past program overprojections should be disregarded in reaching an estimate of the year's total order value. Assuming that the FY 79 order value projections have been developed in approximately the same manner as were the FY 77 and FY 78 projections, one might hypothesize that some degree of overestimation will eventually be shown to exist in the FY 79 total DARCOM-wide order value of \$1,731 million. In paragraph 5b(2) above, it was observed that FMS order values projected for mid-year were better estimates of actual FMS year-end values than were the projections for end-of-year. Based on this observation, one might consider adjusting the FY 79 projections by using the FMS mid-year estimates as end-of-year estimates. This would reduce the projected total DARCOM order value for FY 79 by approximately 14 percent to \$1,486 million. The validity of such a reduction is, of course, questionable, especially in



view of comments made at the 20 December 1978 meeting by the GOA comptroller representatives. They emphasized strongly that the record of the last two years is not a suitable basis for evaluating the current year program because of the many procedural changes that have been made during this period in the management of the customer program.

(2) Quarterly Performance Patterns.

(a) Quarterly performance in terms of dollar values is shown graphically in a set of figures in Appendix A. Quarterly dollar values of orders accepted, commitments, and obligations are graphed so that actual performance in FYs 77 and 78 can be compared with the projections for FY 79. Separate figures are presented for each appropriation and for each type customer as well as for the DARCOM aggregate.

(b) It was observed in paragraph 5b(6)(b) above that the consistency of quarterly performance patterns in the last two years provides some basis for expecting the same patterns in FY 79. The comparison is shown graphically in Figure 7 wherein the aggregate trends previously shown in Figure 6 are displayed against the projected FY 79 quarterly patterns. The phasing of order value acceptance projected for FY 79 is seen to be very similar to that experienced in the last two years. The phasing of FY 79 commitments as a percent of order value accepted by the end of each quarter shows a somewhat higher performance level in the first three quarters than was demonstrated in the past. The end-of-year projection of 88 percent of OAs committed lies nicely between the historical values of 89 and 87 percent in FYs 77 and 78. The largest discrepancy between projected and past

PATTERNS OF QUARTERLY PERFORMANCE  
FY 77 ACTUAL, FY 78 ACTUAL, AND FY 79 PROJECTED

ALL APPROPRIATIONS - ALL CUSTOMERS

KEY:  
FY 77  
FY 78  
FY 79

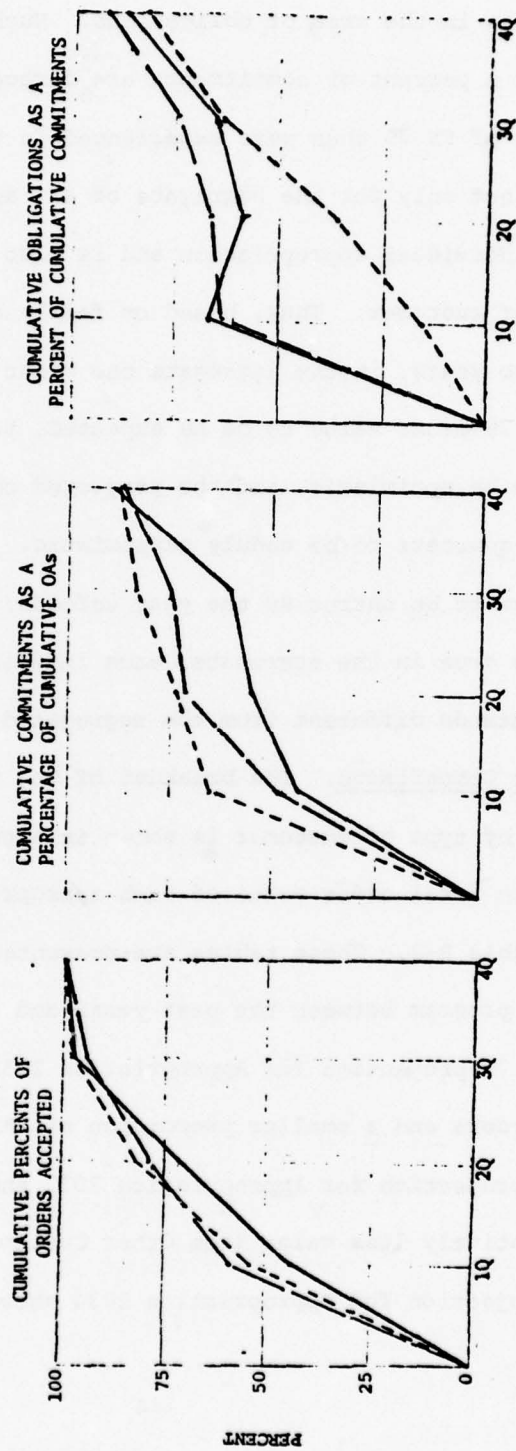


FIGURE 7.

performance lies in the area of obligations. Much smaller values of obligations as a percent of commitments are forecast for the first and second quarter of FY 79 than were experienced in the preceding years. This is true not only for the aggregate of all appropriations, but is true of each individual appropriation and is also true for the program of each type of customer. Thus, based on fairly consistent performance in the past two years, in the aggregate one might judge the projected phasing of FY 79 order value to be as expected, the projected commitment performance to be optimistic, and the projected obligation performance for the first two quarters to be unduly pessimistic. Obviously, these judgments may prove to be untrue as the year unfolds; additionally, although they may prove true in the aggregate, each individual appropriation may well exhibit trends different from the aggregated trends.

(3) Other Comparisons. The breakout of the total order value of each appropriation by type of customer is shown in Appendix B, Table B-1. The breakout of the total order value of each appropriation by GOA is shown in Appendix B, Table B-2. These tables are presented so that changes in the nature of the program between the past years and the current year can be seen. The FY 79 projection for Appropriation 2031 shows a larger proportion of FMS orders and a smaller proportion of MAP orders than in FYs 77 and 78. The projection for Appropriation 2032 shows relatively more FMS value and relatively less value from Other Customers in FY 79 than in the past. The projection for Appropriation 2034 shows the opposite to that of

2032; that is, a relative decrease in FMS compared to Other Customer orders. The breakout by GOA shows little change except in Appropriation 2033 where, in FYs 77 and 78, TARCOM had approximately 60 percent and ARRCOM approximately 40 percent of order value. The projection for FY 79 reverses this with a 32 percent share forecast for TARCOM and a 62 percent share for ARRCOM. In dollar terms, ARRCOM is projecting approximately 110 million dollars more in orders in FY 79 in Appropriation 2033 and TARCOM approximately 100 million dollars less than actual order values experienced in FY 78.

6. A Proposed Alternative Method for Projecting the Customer Program.

a. The original objective of this study envisioned the development of new, or the modification of existing, computer simulation models to permit the forecasting of FMS orders accepted, commitments and obligations for each appropriation, as required for the RCS CSCAB-307 reports. However, the computer model approach has not been investigated in this study for several reasons. The data base available in currently automated systems lacks the level of detail necessary for accurate forecasting; specifically, automation of Part B of DD Form 2060, FMS Obligational Authority, under the Army Customer Order Control System, is considered necessary before a useful computer model can be structured. Moreover, as emphasized in paragraph 5 above, the total value of the customer program for at least some of the GOAs should not be forecast from the historical trend, but from knowledge of current customer intent. Thus, any model would, of necessity, need to have a considerable input prepared manually by program analysts. Additionally, there is still considerable doubt that a model would have universal



application at all GOAs involved in the customer program; the nature of the program varies widely between GOAs both in volume and value of cases, and in the relative size of the FMS, MAP, and Other Customer programs. Thus, a generalized model might prove to be infeasible.

b. Based on findings and observations resulting from this and previous LSO studies, an alternative method of developing the customer program forecasts is proposed in paragraph d below. It may well be that the alternative method will not be as efficient as the current methods for all GOAs because of the fact that the alternative method is developed primarily from results of analysis of DARCOM-wide aggregated results. However, it is suggested that the alternative method could be used by each GOA in addition to the current method to develop projections. Large discrepancies between the projections resulting from each method could be analyzed, and a more accurate revised forecast obtained. The proposed method would also provide DARCOM a tool for evaluating the aggregated program, in the manner demonstrated in paragraph 5c above.

c. The proposed alternative method depends heavily on historical experience and the use of statistical data, except in the basic starting point for the projection process; namely, up-to-date information on known, pending, and developing customer cases. Once a complete list of customer interests is in hand, all other steps in developing the projections require the use of statistics from the historical experience.

d. Described in detail below are the four steps comprising the alternative method for predicting the customer program.

Step 1 - This step requires the development of a projection of the total value of orders accepted for the fiscal year. The projection will be the sum of the separate projections of FMS, MAP, and Other Customer programs. Projections of the total year's value of MAP and Other Customer orders would be made as in the past. Projections of the total year's value of FMS orders would require analysis of all known, pending, and developing orders. No walk-in business would be forecast. Separate handling of high-value cases would be required. The suggested criterion for a high-value case is any case whose value exceeds ten percent of the value of total orders accepted in the applicable appropriation the preceding year. Each high-value case would be realistically evaluated, both for probability of acceptance and, assuming acceptance, for probability of inclusion in the current year or budget year program. The acceptance probability should be judged on the basis of an up-to-date evaluation by Military Assistance Group or embassy personnel in-country. The determination of year of case acceptance would require knowledge of elapsed times for cases to reach the point of acceptance by the foreign country and of elapsed times then for case implementation, commitment, and obligation. The emphasis on obligation within the same fiscal year as case acceptance appears to offer the GOAs a degree of control over the current year's workload, because the acceptance date of record of newly-developing cases might be delayed to the budget year rather than being scheduled for the current year. FMS cases not meeting the high-value criterion would be batched, and their total value decremented according to historical rejection rates. The resulting value would then be apportioned to the current and budget year programs, based on an analysis of the percents of total value represented by cases already accepted, cases where LOAs already have

been provided to the foreign country, and cases which are still in the pre-LOA stage. Again, elapsed times from first evidence of customer interest to obligation must be realistically appraised by each GOA based on recent experience.

Step 2 - This step requires the quarterly/monthly phasing of the total year's value of orders accepted. The historical pattern of such phasing at each GOA would be used to phase the value of orders, except for those high-value cases whose acceptance/commitment/obligation dates were known with some degree of certainty. In connection with this, the high degree of uncertainty in the customer program makes accurate monthly projections almost impossible. A change in the RCS CSCAB-307 requirement from monthly to quarterly projections would ease the burden on the GOA personnel, both in the making of the projections and in documenting reasons for failure to meet the projections.

Step 3 - This step requires the quarterly/monthly phasing of commitments. The phased values of orders resulting from Step 2 and the historical pattern at the GOA of commitments as a percent of orders accepted by the end of each time period would provide the basis for phasing of commitments. The comments made above for Step 2 regarding the desirability of quarterly rather than monthly projections apply to commitment values as well as to order values. In any case, a change to quarterly projections of orders would of necessity imply quarterly projections of commitments and obligations under this alternative method.

Step 4 - This step requires the phasing of obligations. The phased values of commitments resulting from Step 3 and the historical pattern at the GOA of obligations as a percent of commitments by the end of each time period would provide the basis for obligation projections. The use of quarterly or monthly periods would be dictated by the periods used to schedule order values.

7. Findings, Conclusions, and Recommendations.

a. Findings.

(1) The net effect DARCOM-wide of the scrubbing of projections of the FY 79 customer program was to reduce the projected value of orders accepted by 3.3 percent, of commitments by 10.1 percent, and of obligations by 6.4 percent.

(2) No significant changes in methods of forecasting were made by the GOAs during the scrubbing operation; rather, earlier errors were corrected and a simple updating was made based on added information available at the later date.

(3) There was general agreement among the DARCOM GOA comptroller representatives that forecasts of the total value of the reimbursable customer program should not be based on the trend of total value in previous years. Additionally, the GOA comptroller representatives stated that evaluation of the time-phased FY 79 projections of orders accepted, commitments, and



obligations against performance in previous years was invalid because of the many procedural changes that have been implemented in the last two years.

(4) Projections of the total order value of MAP and Other Customer programs in FY 77 and FY 78 were within acceptable levels of accuracy.

(5) Projections of the FMS order values in FY 77 and FY 78 were much higher than what actually materialized. DARCOM-wide and for most of the individual appropriations, the projections of mid-year order values were much closer to the values realized by year-end than were the projections of year-end order values.

(6) Orders not requiring commitment because of their classification represented only a minor portion of orders accepted in the last two years; namely, 5.6 percent in FY 77 and only 0.5 percent in FY 78.

(7) In FY 77, 89 percent of total DARCOM-wide order value (all classifications) was committed and 78 percent was obligated by year end. In FY 78, 87 percent of total DARCOM-wide order value (all classifications) was committed and 78 percent was obligated by year end.

(8) The quarterly pattern of order 'value' acceptance DARCOM-wide was fairly consistent in the past two years; that is, approximately 50 percent of the year's total order value materialized in the first quarter, 25 percent in the second quarter, 20 percent in the third quarter, and only 5 percent in the last quarter.

(9) The DARCOM-wide pattern of cumulative commitments as a percent of cumulative order value by the end of each quarter showed some consistency between FY 77 and FY 78. Commitment performance generally improved as the

year advanced; it was evidently difficult to keep commitments abreast of the large influx of order value in the first quarter but reduced order volume in later quarters permitted improved commitment performance.

(10) The DARCOM-wide pattern of obligations as a percent of commitments by the end of each quarter showed good consistency between FY 77 and FY 78. For the first three quarters, approximately two-thirds of the value committed by quarter end had been obligated and approximately 90 percent of total commitment value had been obligated by year end.

(11) Based on projection inaccuracies in the past two years, the FY 79 DARCOM-wide projection of orders accepted may be overestimated by as much as 15 percent.

(12) Based on fairly consistent performance patterns DARCOM-wide in the past two years, the quarterly phasing of projected FY 79 order value percentages appears appropriate, whereas projected commitment performance appears somewhat optimistic in the first three quarters and projected obligation performance appears to be unduly pessimistic in the first two quarters.

b. Conclusions.

(1) The trend of total customer program values in preceding years is not a satisfactory basis for projecting the total value of current and future year programs; rather, program projections should be based on current knowledge of individual customer intentions, that is, on known, pending, and developing cases.

(2) Over-projections of the FMS program in previous years resulted from several causes including overestimation so as to obviate the necessity for additional authority/fund requests later in the year, failure to recognize

the long elapsed times from first evidence of customer interest to case implementation, and the inclusion of "walk-in" business.

(3) Although historical trends are considered unsuitable for projecting the total customer program value, forecasts of all other elements of the program should consider statistics based on the historical record. As a minimum, these statistics include case acceptance/rejection rates (by individual country/customer type where appropriate); elapsed times between major case development and execution actions; time-phasing of orders, commitments, and obligations throughout the year; and cancellation rates of accepted orders.

(4) Based on consistent DARCOM-wide patterns of customer program performance in the past two years, an alternative method of program projection is considered to have potential for use at each GOA in addition to the current method and for use at DARCOM level as a validity check on the total program.

(5) Development of a computerized model for forecasting the FMS customer program should be delayed until Part.B of the DD Form 2060, FMS Obligational Authority, is automated under the Army Customer Order Control System and an adequate base of historical data is accumulated thereafter.

c. Recommendations. It is recommended that:

(1) An alternative method of projecting the customer reimbursable program, as described in this report, be considered for use in addition to the current method at the DARCOM GOAs and for use as a validation check at DARCOM headquarters. Major features of the method include projection first

of the total order value for the year from knowledge of known, pending, and developing cases and the subsequent phasing of this total value, with associated commitments and obligations, by time periods through the year in accordance with historical experience.

(2) Projections of the total value of FMS orders include no "walk-in" business.

(3) Consideration be given to changing the RCS CSCAB-307-11 report requirement from separate forecasts for each of the twelve months to aggregated forecasts for each of the four quarters of the appropriation year.

(4) Consideration be given to the development of an automated model for forecasting the elements of the RCS CSCAB-307-11 reports after the automated Army Customer Order Control System has been augmented to include data from Part B of DD Form 2060 and an adequate data base exists therein.

.. .



## APPENDIX A

Graphical Comparisons in Dollar Values of Actual  
Performance in FY 77 and FY 78 with Projected  
Performance in FY 79

<u>Figure</u>		<u>Page</u>
A-1	All Appropriations - All Customers	A-2
A-2	Appropriation 2031 - All Customers	A-3
A-3	Appropriation 2032 - All Customers	A-4
A-4	Appropriation 2033 - All Customers	A-5
A-5	Appropriation 2034 - All Customers	A-6
A-6	Appropriation 2035 - All Customers	A-7
A-7	All Appropriations - FMS Customers	A-8
A-8	All Appropriations - MAP Customers	A-9
A-9	All Appropriations - Other Customers	A-10

.. .

# COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

## ALL APPROPRIATIONS - ALL CUSTOMERS

KEY: — Orders Accepted  
 --- Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

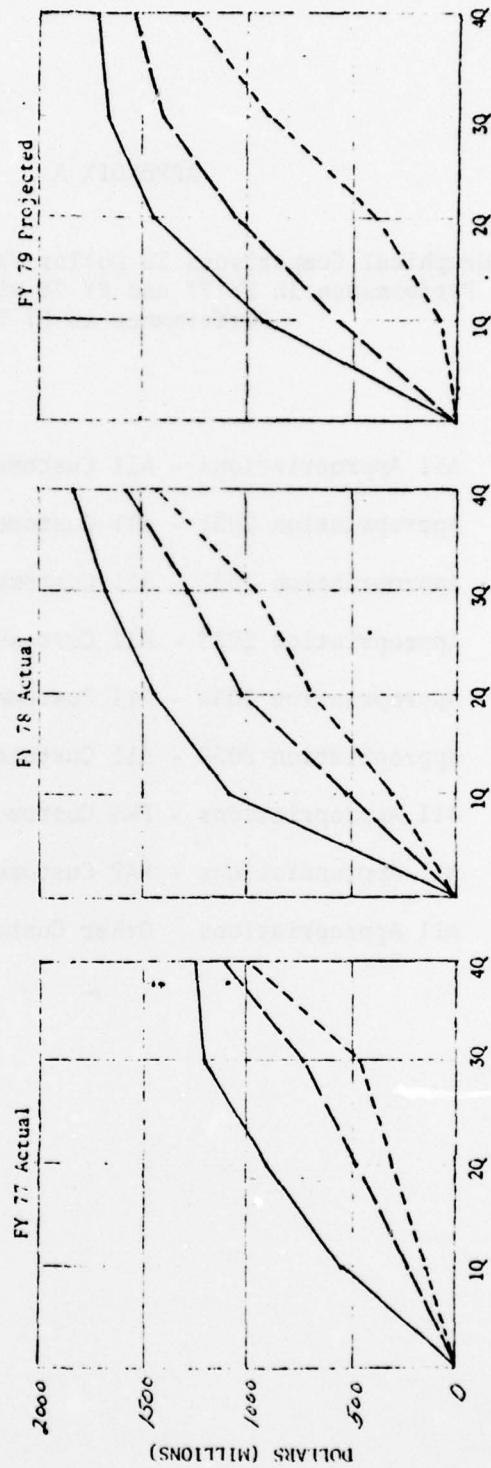


FIGURE A-1.

COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

APPROPRIATION 2031 - ALL CUSTOMERS

KEY: — Orders Accepted  
 --- Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

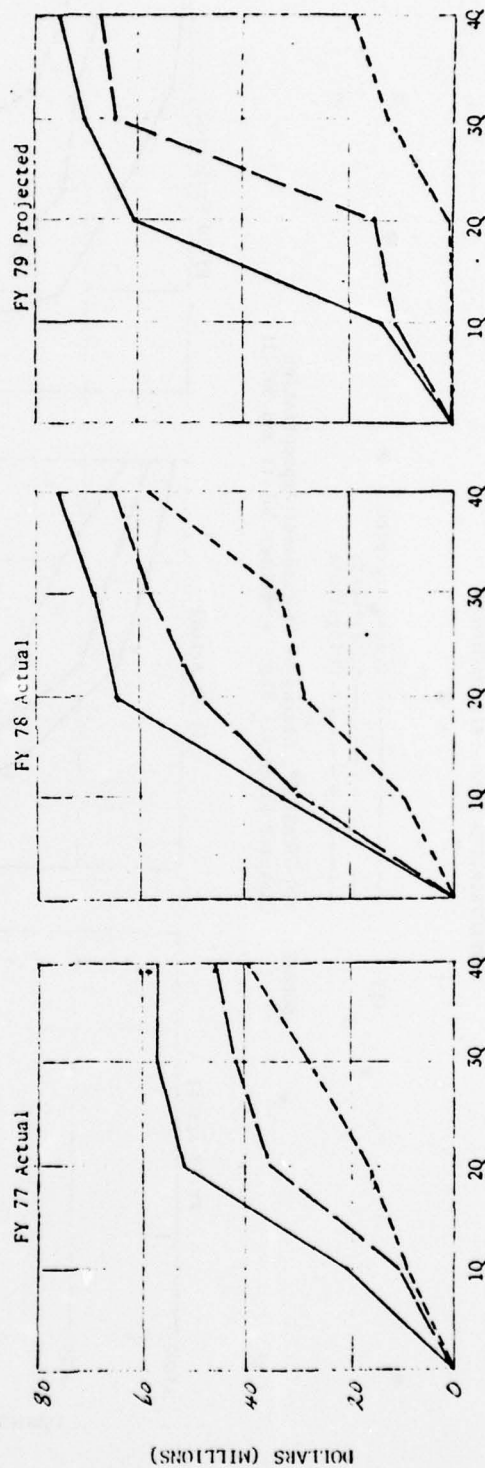


FIGURE A-2.

# COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

## APPROPRIATION 2032 - ALL CUSTOMERS

KEY: — Orders Accepted  
 --- Commitments  
 - - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 507-21

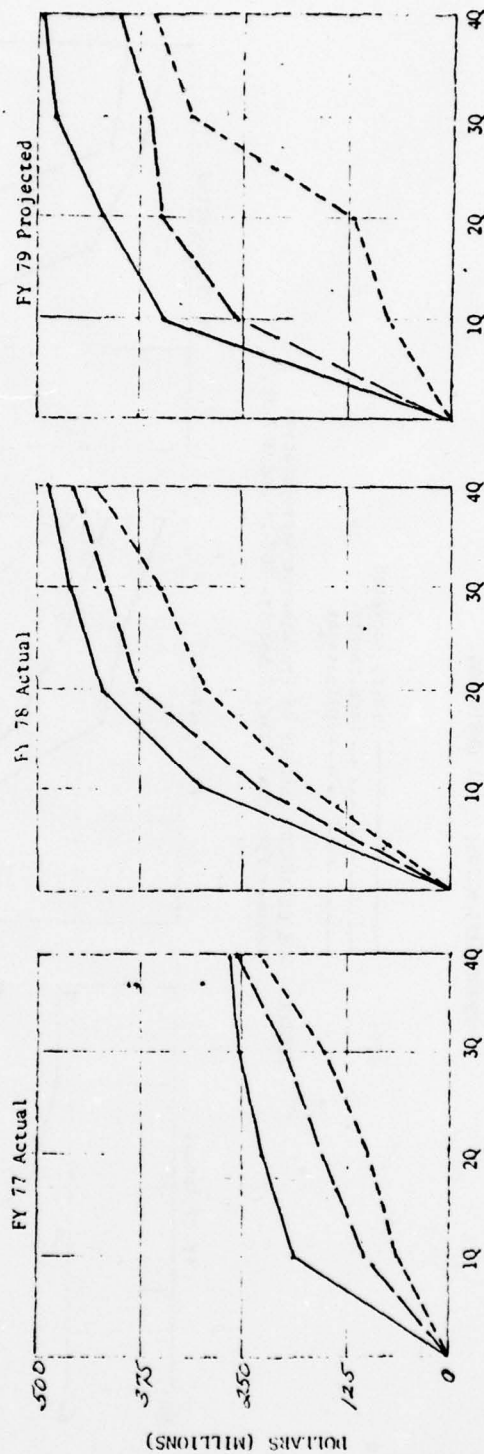


FIGURE A-3.



COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

APPROPRIATION 2033 - ALL CUSTOMERS

KEY: — Orders Accepted  
 — Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

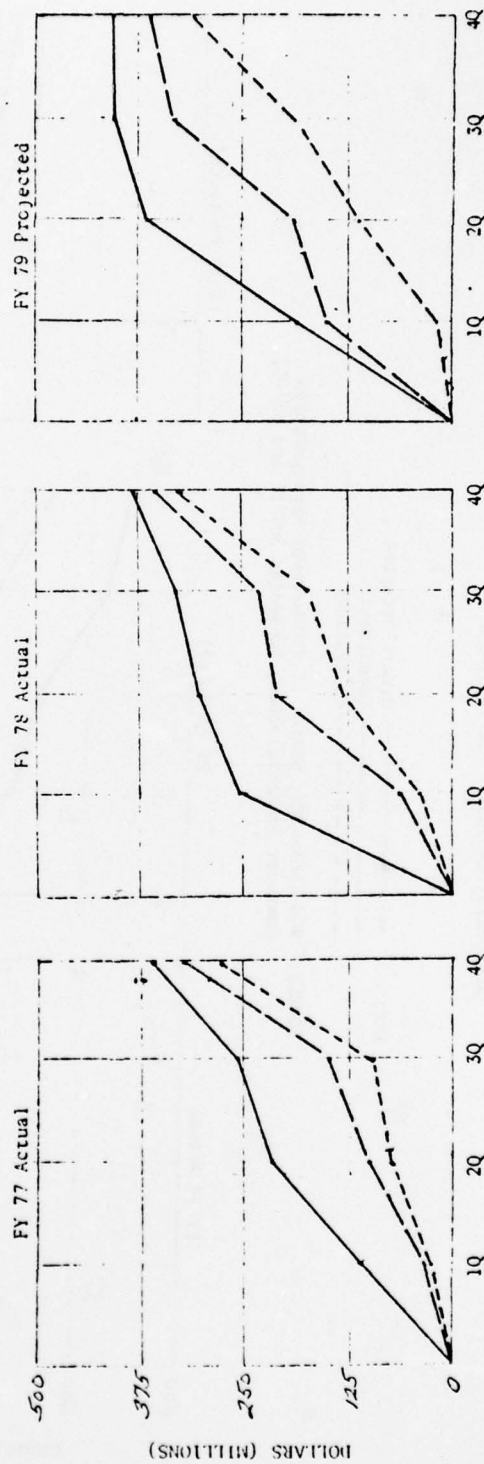


FIGURE A-4.

COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

APPROPRIATION 2034 - ALL CUSTOMERS

KEY: — Orders Accepted  
 --- Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

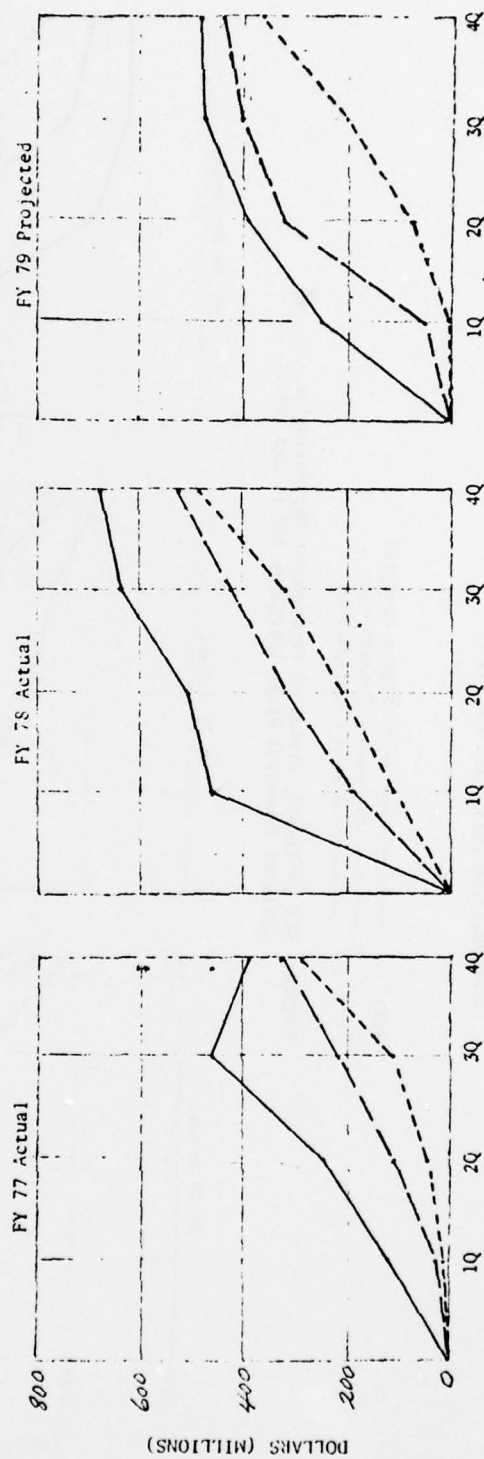


FIGURE A-5.

# COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

APPROPRIATION 2035 - ALL CUSTOMERS

KEY:  
 — Orders Accepted  
 - - - Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

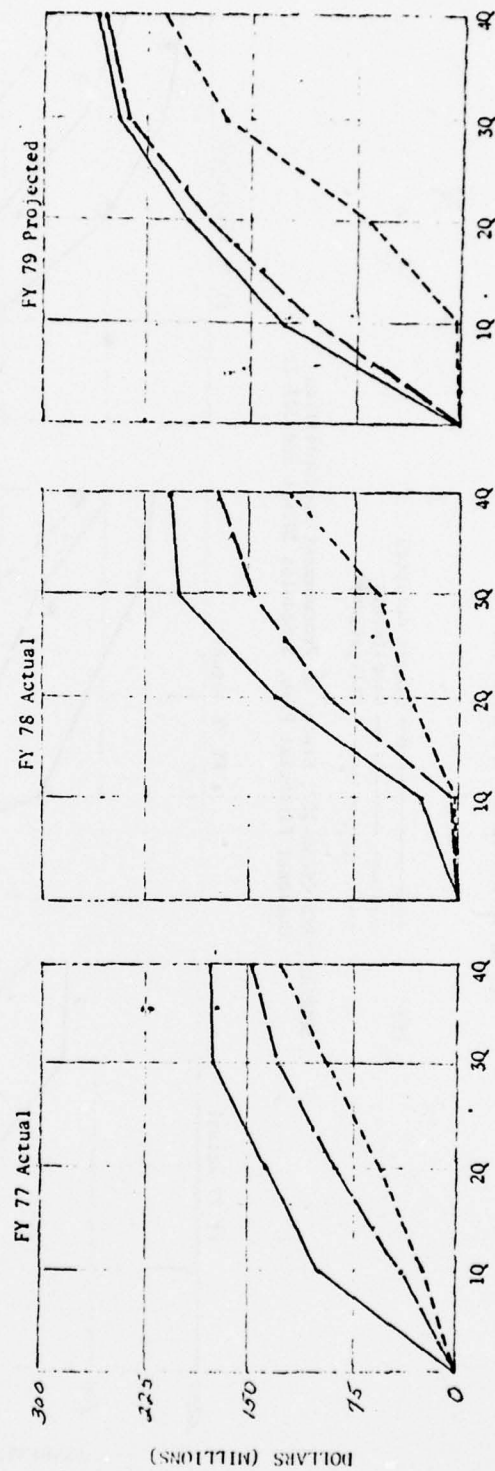


FIGURE A-6.

COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

ALL APPROPRIATIONS - FMS CUSTOMERS

KEY:

—— Orders Accepted  
 --- Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

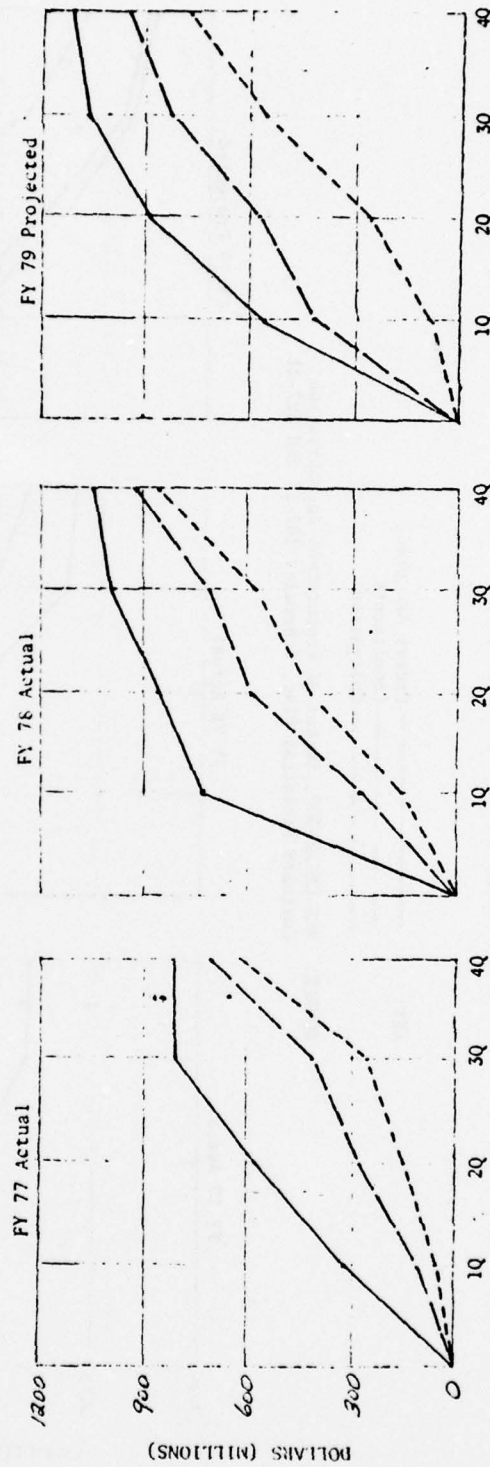


FIGURE A-7.



COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

ALL APPROPRIATIONS - MAP CUSTOMERS

KEY: — Orders Accepted  
 --- Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

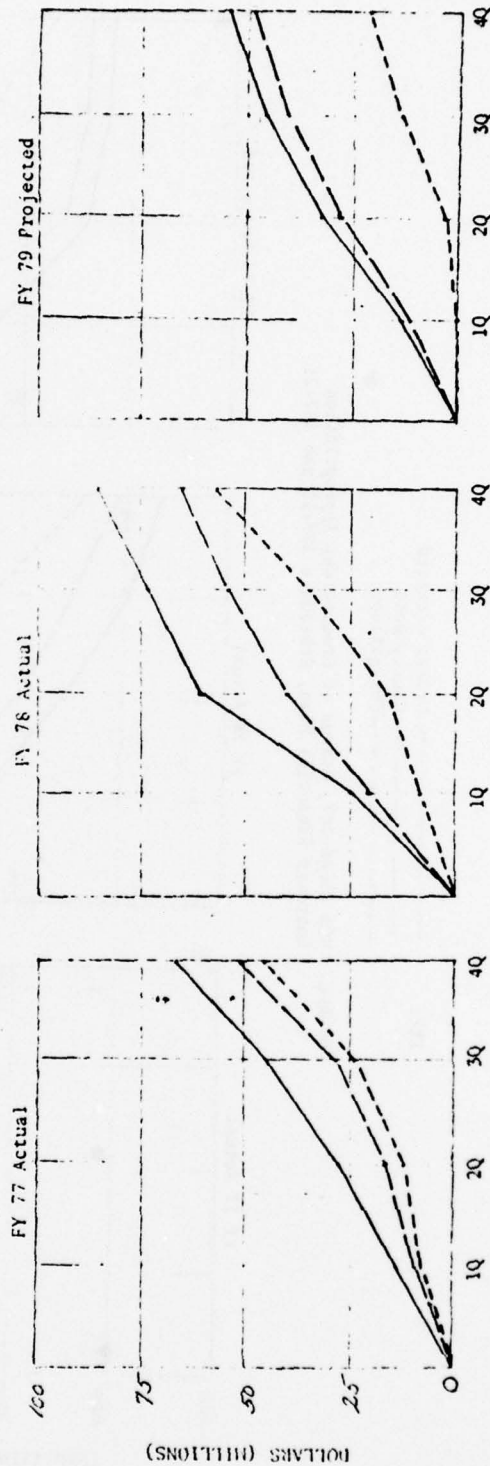


FIGURE A-8.

COMPARISON OF ACTUAL PERFORMANCE IN FY 77 AND FY 78 WITH PROJECTED PERFORMANCE IN FY 79

ALL APPROPRIATIONS - OTHER CUSTOMERS

KEY:  
 — Orders Accepted  
 - - - Commitments  
 - - - Obligations

SOURCE: RCS CSCAB-307, Status of Procurement Appropriation  
 Customer Financial Plan, Schedules 307-11 and 307-21

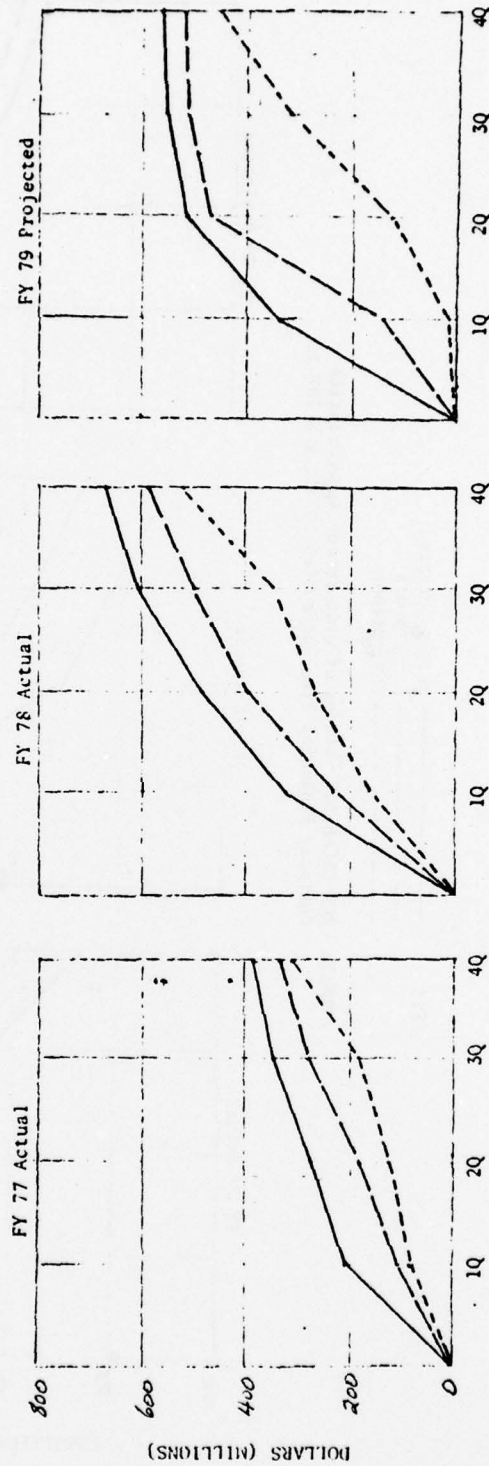


FIGURE A-9.

## APPENDIX B

### ORDER VALUE ATTRIBUTABLE TO EACH GOA AND TO EACH CUSTOMER TYPE

#### Table

- B-1      Percentage of Order Value Represented by Each  
Type Customer by Appropriation - FY 77 Actual,  
FY 78 Actual, FY 79 Projected
- B-2      Percentage of Order Value Represented by Each  
GOA by Appropriation - FY 77 Actual, FY 78  
Actual, FY 79 Projected

TABLE B-1

PERCENTAGE OF ORDER VALUE REPRESENTED  
BY EACH TYPE CUSTOMER BY APPROPRIA-  
TION - FY 77 ACTUAL, FY 78 ACTUAL, FY  
79 PROJECTED

Approp.	Data	Orders Accepted (\$000)	Percent of OAs Resulting From:			
			FMS	MAP	Other	Total
2031	FY 77 Actual	56,241	48.2	31.1	20.7	100.0
	FY 78 Actual	76,751	41.9	39.3	18.8	100.0
	FY 79 Proj.	74,985	80.4	0.8	18.8	100.0
2032	FY 77 Actual	268,283	80.2	0.7	19.1	100.0
	FY 78 Actual	481,970	80.5	3.0	16.5	100.0
	FY 79 Proj.	498,403	91.5	2.5	6.0	100.0
2033	FY 77 Actual	353,913	82.1	9.0	8.9	100.0
	FY 78 Actual	377,940	76.6	3.9	19.5	100.0
	FY 79 Proj.	414,008	83.8	5.9	10.3	100.0
2034	FY 77 Actual	391,326	42.4	0.8	56.8	100.0
	FY 78 Actual	664,530	42.8	1.6	55.6	100.0
	FY 79 Proj.	477,963	30.5	0.6	68.9	100.0
2035	FY 77 Actual	175,109	54.2	6.8	39.0	100.0
	FY 78 Actual	208,936	32.6	7.5	59.9	100.0
	FY 79 Proj.	266,100	41.2	5.5	53.3	100.0
ALL	FY 77 Actual	1,244,872	63.8	5.3	30.9	100.0
	FY 78 Actual	1,810,127	58.7	4.8	36.5	100.0
	FY 79 Proj.	1,731,459	64.6	3.2	32.2	100.0



TABLE B-2

PERCENTAGE OF ORDER VALUE REPRESENTED BY EACH GOA BY APPROPRIATION -  
FY 77 ACTUAL, FY 78 ACTUAL, FY 79 PROJECTED

Appropriation	Year	Percent of Order Value by GOA							Total	
		ARRCOM	CERCOM	MIRCOM	TARCOM	TSARCOM	ARRAD-COM	MIRAD-COM		TARAD-COM
2031	77	7.3	3.3	TR*	-	89.4	-	-	-	100.0
	78	12.3	2.0	0.8	-	84.9	-	-	-	100.0
	79	12.9	2.8	11.8	-	72.5	-	-	-	100.0
2032	77	0.1	0.2	99.7	-	-	-	-	-	100.0
	78	TR*	0.2	93.2	-	-	-	6.6	-	100.0
	79	0.1	0.1	93.8	-	-	-	6.0	-	100.0
2033	77	39.2	-	-	60.8	-	-	-	-	100.0
	78	39.4	-	-	60.2	-	-	-	0.4	100.0
	79	62.3	-	-	31.7	-	5.2	-	0.8	100.0
2034	77	96.0	-	4.0	-	-	-	-	-	100.0
	78	92.8	-	-	-	-	6.1	1.1	-	100.0
	79	86.0	-	-	-	-	6.5	7.5	-	100.0
2035	77	7.3	23.4	0.7	61.3	7.3	-	-	-	100.0
	78	6.6	16.4	0.5	54.3	8.6	-	1.2	12.4	100.0
	79	2.0	16.4	12.7	59.5	3.5	-	-	5.9	100.0
ALL	77	42.7	3.5	22.8	25.9	5.1	-	-	-	100.0
	78	43.6	2.0	24.9	18.8	4.6	2.3	2.3	1.5	100.0
	79	39.5	2.7	29.5	16.7	3.7	3.0	3.8	1.1	100.0

\*Less than 0.05 percent

## APPENDIX C

### CUSTOMER ORDER CLASSIFICATION CODES (From AR 37-120, Appendix A)

CP - Customer peculiar item, sale from procurement. The classification applied to a customer order when the item to be furnished is peculiar (not stocked by or purchased for the Army) to the customer and is purchased for delivery to a customer. These items would not appear for procurement on a direct Army program, either specifically or in terms of the preferred item.

RP - Retention of inventory, sale from procurement. The classification applied to a customer order when the item to be procured is common to the Army and customer. An example is the procurement, for a customer, of M151 1/4-Ton Trucks, whether or not M151 Trucks are on hand in the Army inventory.

RS - Retention of inventory, sale from stock. The classification applied to a customer order when the item to be furnished from stock is common to the Army and customer, and the Army stock is to be replaced through procurement action within the three-year obligational period of the current appropriation. In order to be coded under this category the item to be procured must be the preferred item, or procured to replace an acceptable substitute. Two examples are the sale and purchase of M151 1/4-Ton Trucks, and the sale and purchase of M38A1 1/4-Ton Trucks.